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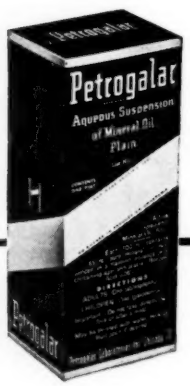

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Guest Editorial

War Wounds of the Major Arteries of the Extremities

SURGEONS in the combat zones in this war are encountering a high incidence of serious wounds, many of them involving large arteries. The proper management of the severely wounded requires exception judgment and skill, especially when the large arteries of the extremities are involved, for one then has to consider the danger of the loss of limb as well as the danger of the loss of life. This concept is especially important during the periods of emergency treatment and subsequent transportation.

The emergency treatment of patients with wounds of large arteries consists essentially of controlling the hemorrhage and combating shock. Bleeding must be controlled promptly and efficiently, but, when possible, measures should be employed which do not interfere with the collateral circulation. There is a tendency to consider the application of a tourniquet the procedure of choice for the control of bleeding from the large arteries of the extremities, but this is not as it should be. The tourniquet should be thought of as the final resort, to be used only when other measures have failed or are obviously inapplicable, for it obliterates all collateral channels and thereby jeopardizes the life of the limb. Bleeding from vessels exposed by the destruction of overlying tissues should be controlled by the application of ligatures both proximal and distal to the injured segment. When blood is escaping through a deep narrow channel, local compression will frequently suffice. If the bleeding is temporarily controlled by local compression, a tourniquet should be placed loosely around the extremity during transportation; it should not be tightened unless bleeding recurs. If it is necessary to control hemorrhage by the use of a tourniquet, a placard stating the time of its application should be attached to the patient's clothing. Patients so designated should be transported to a hospital and treated with a minimum of delay. If the tourniquet must be kept in place unduly long, it should be released for a few minutes each hour, the bleeding being temporarily controlled by direct pressure.

When patients with wounds of the major peripheral arteries reach a surgical hospital, they should be treated for shock, and the decision then made as to whether or not immediate operation is necessary. This decision may be difficult, but, in general, if bleeding does not recur and the circulation in the extremity is adequate, op-

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eration may be deferred. If operation is necessary, the injured tissues overlying the vessel should be excised and the artery exposed before the decision is made whether to repair or ligate it. Repair is especially indicated when the popliteal, common femoral, or carotid arteries are involved, because of the small number of collateral channels associated with these vessels. During World War I, the repair of injured arteries was not often feasible, but the postoperative administration of heparin has greatly improved the results from arterial suture.

If the character of the wound precludes successful repair, the injured segment of vessel should be resected and both ends ligated with heavy nonabsorbable material. The concomitant vein should also be ligated. Prompt measures must then be taken to preserve the integrity of the extremity, by increasing its blood supply, by decreasing the rate of metabolism, and by preventing infection. Measures to increase the blood supply are, in the order of their importance, sympathetic nerve block, placing the extremity at the proper level—usually somewhat below that of the left ventricle —the administration of vasodilator drugs as nicotinic acid, papaverine, and whiskey, and the application of heat *proximal* to the site of occlusion. Local ischemia must be prevented if possible by frequent change of position and careful padding over bony prominences. The blood volume and content must be restored by transfusion, and if there is cyanosis the administration of a high concentration of oxygen is desirable. Occasionally the flow of blood through an extremity may be increased by the use of the so-called Pavex machine, which alternately produces positive and negative pressure. Unfortunately, this form of treatment is undesirable in the presence of extensive wounds and is absolutely contraindicated when infection is present. Furthermore, such a machine is of value only when the obstruction occurs at a sufficient distance from the trunk to permit proximal application of the cuff. The metabolic rate may be decreased by putting the extremity at complete rest and by temperature control. The optimum temperature cannot be stated definitely, but it is certain that heat should not be applied, and moderate cooling, to ordinary room temperature—72° F—is probably desirable. An attempt should be made to prevent infection by the local and systemic use of the sulfonamide drugs.

With the use of these measures, several of which have been introduced since World War I, it is to be expected that the untoward results of major vessel ligation will be appreciably decreased in the present war.

I. A. BIGGER, M. D.,
Professor of Surgery,
Medical College of Virginia, Richmond.

CLINICAL-PATHOLOGICAL CONFERENCE*

LOUIS HAMMAN, M.D.,
Baltimore, Maryland.

Dr. Richard Whitehill very kindly abstracted the records of the two cases to be presented and discussed this morning. With the abstracts came a courteous note explaining that he had gone to great pains to find easy cases so that there would be no danger of embarrassment by a public failure to diagnose them correctly. My suspicion was aroused when I discovered that he had gone back three years to find the first easy case. However, you must be the judge of how easy the cases are.

CASE 1.—W.G., a 23-year-old single colored male, was admitted to the Norfolk General Hospital on June 14, 1938, and discharged on July 20, 1938. The patient stated that four weeks before admission he had strained himself and his testicles had become swollen. He had no urethral discharge. This swelling improved. Two weeks later he developed a pain around the umbilicus which was continuous and did not radiate. There was no nausea or vomiting. Before the onset of the abdominal pain his bowels had moved normally. Subsequently, however, they had been somewhat constipated. He thought he had been running some fever ever since the onset of the abdominal pain and that he had lost about twenty pounds. The patient's past health had been good. He had had no previous similar attacks. He had had the usual childhood diseases and had never been operated on. He had never had gonorrhoea but had had a sore penis four years before. He had received no anti-luetic treatment. He had never been troubled with shortness of breath or cough. For an indefinite time he had had some eructation of gas and had had nocturia for two to five times. The family history was non-contributory.

Physical examination revealed a well-developed but poorly nourished colored male who was in no apparent distress. The temperature was 101, pulse 88, respirations 22, and blood pressure 110 over 70. The head was negative, the pupils reacted normally to light and accommodation, the nose was negative, the tonsils were chronically infected and there was no rigidity of the neck. The lungs were clear to percussion and auscultation. The heart was not enlarged, the rhythm was regular and there were no murmurs or accentuated sounds. The abdomen was flat and no masses or viscera were palpable. The recti were tense around the umbilicus and there was some tenderness on deep pressure in the mid upper epigastrium. There were a few shotty inguinal lymph nodes. There was no generalized glandular enlargement. The genitalia were normal. The rectal examination was normal. There was no abnormality of the skin. The hemoglobin was 101, the red cell count was 5,060,000 and the white cell count 19,600. There were 87 per cent neutrophiles, 9 per cent small lymphocytes, 3 per cent endothelial cells, and 1 per cent eosinophiles. The Wassermann reaction was positive. The urine had a specific gravity of 1.018 and was negative for albumen and sugar. The microscopic examination of the urine was negative. On admission no definite diagnosis was made.

On June 16th it was noted that there was some rigidity over the entire abdomen and that there was distinct tenderness over the region of the appendix, umbilicus and epigastrium. At that time diagnosis of acute appendicitis, diverticulitis, and perforated ulcer were considered. For the first ten days the patient ran a spiking temperature from 99 to 102. The urine continued negative. The white count ranged between 13,000 and 26,000. A Widal reaction on June 19th showed a four plus in a one to fifty dilution, four plus in a one to one hundred dilution, two plus in a one to two hundred dilution and one plus in a one to four hundred dilution. A stool culture was negative for pathogens. The patient continued to complain of pain in the upper central portion of the abdomen and continued to have muscle spasm and tenderness in the epigastrium. Because of these findings, and the positive Widal, a diagnosis was made of typhoid fever with a perforated ulcer which had probably walled off. However, this diagnosis was in doubt, especially since it was learned that the patient had had typhoid vaccine in 1935. His spleen was never felt. It was decided to perform an exploratory laparotomy and this was done on June 23rd. At operation the abdominal cavity was found to contain a moderate amount of free oily fluid and there seemed to be liquefaction of the fat in the omentum and mesentery. Several large glands were found. The stomach and pylorus were essentially negative. The kidneys seemed normal. The spleen was slightly larger than normal and there were adhesions about it. The pancreas did not seem remarkable. The liver did not seem remarkable. The appendix was elongated and somewhat hyperemic. An appendectomy was performed and two enlarged glands were removed. The pathological diagnosis of these specimens was subacute appendicitis and subacute lymphadenitis.

For the remainder of the patient's stay in the hospital he ran an irregular, swinging fever from 99 to 102. He developed a moderate anemia with a hemoglobin of 60 and a red count of 3,000,000. His white count remained between 15,000 and 20,000. The differential white count showed 85 per cent to 90 per cent polymorphonuclear leucocytes. His urine remained negative except for traces of albumen. Blood cultures and stool

*Presented at the annual meeting of the Medical Society of Virginia at Virginia Beach, October 6-8, 1941.

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cultures were negative. Two more Widal reactions showed about the same agglutination with B. typhosus but were negative with paratyphoid A. and B., and B. melitensis. A spinal puncture showed normal pressure and cytology, a moderate increase in globulin and a negative Wassermann. His pulse became more rapid. His progress was generally downhill. He continued to complain principally of abdominal pain. On July 20th the patient left the hospital against advice. At that time a diagnosis had not been reached.

On August 5, 1938, the patient was admitted to St. Vincent's Hospital and died on August 7, 1938. He was extremely ill and a fragmentary history was obtained. He stated that he had continued to lose weight and strength and was running fever. Very recently he had begun to spit up blood. His temperature was normal, his pulse 100, and respirations 40. He showed extreme malnutrition. The heart was negative and there were bubbling rales throughout both lungs. The abdomen was generally tender and rigid. The scar of the recent operation was well healed. The urine showed three plus albumen and a few pus cells. The hemoglobin was 50 per cent, the red cell count 2,790,000, the white cell count 34,000, of which 80 per cent were polymorphs, 8 per cent lymphocytes, 10 per cent stab cells, and 2 per cent transitional. An X-ray of his lungs showed that the lower two-thirds of both lungs were involved by an extensive atelectatic process which gave the appearance of snow balls. It was estimated that there was less than 10 per cent of healthy lung tissue. The transverse diameter of the heart measured 14½ cm. and the greatest diameter of the thorax 26 cm. The enlargement was almost entirely in the left ventricle. The X-ray diagnosis rested between (1) metastatic carcinoma, (2) pulmonary edema and atelectasis, (3) advanced pulmonary tuberculosis, and (4) fungus infection of the lungs. The patient's condition became steadily worse. He was short of breath and coughed up blood. Two days after admission he expired. The clinical diagnosis at this time was pneumonia and pulmonary edema.

DR. HAMMAN'S DISCUSSION

I think it is at once clear that the clinical manifestations here reported are not typical of those of any common, well-known disease. When I first read the records, I had only a confused impression of what the disease might be and after having read them over again and again, I still am bewildered. The clinical diagnosis recorded at the time of the patient's death was pneumonia and pulmonary edema. It is obvious that this is not a satisfactory diagnosis of the disease from which the patient suffered but merely a diagnosis of the terminal events. Therefore I conclude that the astute clinicians of Norfolk were puzzled and uncertain just as I am.

Let us begin by considering some of the details of the illness, details which do not seem to fit smoothly into the general clinical picture.

The illness began with a strain followed by swelling of the testicles. When the patient entered the hospital four weeks later, the genitalia are reported to have been normal. What is the meaning of this curious bit of evidence? I doubt that it is purely incidental or irrelevant. Perhaps were one sufficiently shrewd, he might recognize it as an important clue to the diagnosis but I confess that I can make nothing helpful of it. At the operation the peritoneal fluid is described as having been oily. What is the significance of oily peritoneal fluid? I have never encountered oily peritoneal fluid and have no idea what interpretation to put upon its presence. Perhaps this is another important clue to the diagnosis but it does not help me and I shall have to wait for the pathologist to make these matters clear.

I wish we were able to decide what relation to the whole illness the extensive pulmonary lesions bore that were present at the patient's last admission to the hospital, two days before he died. Were they an integral part of the illness or were they merely a terminal pulmonary infection? It would be helpful in this connection had roentgenograms of the chest been taken during the first admission, but during that admission the symptoms were entirely abdominal and there were none to attract attention to the lungs. I shall choose to consider the pulmonary symptoms as those of a terminal infection realizing that this choice may be shown to have been wrong.

Our problem then is the diagnosis of an obscure febrile illness of three months duration with symptoms localized chiefly in the abdomen. It will be well to consider all diseases that might possibly cause such clinical manifestations before venturing to decide upon a choice or at least express a preference. The possibilitities may be divided into three groups; first, malignant growths, second, the group of lymph node diseases often spoken of as lymphoblastomata, third, infections.

It is unnecessary for me to emphasize the fact that malignant tumors are often masked by the appearance of a chronic infection. This is particularly true of carcinoma which may cause a long-continued high grade fever under circumstances when the location of the growth escapes detection. Every physician can recall many such experiences. A few weeks ago I examined a man about 50 years of age who for months had had fever, loss of weight

and strength, abdominal discomfort and a decided leucocytosis, from 30,000 to 40,000, with a pronounced eosinophilia. In spite of thorough and complete investigations no abnormality had been found to explain these grave symptoms. Finally, a mass was felt deep in the left side of the abdomen. Exploratory section disclosed a large inoperable mass, on microscopical examination a carcinoma, but its exact nature and point of origin could not be determined. I recall the interesting case of one of the laboratory technicians at the hospital. He was a young man, 27 years of age. He was taken ill with fever, leucocytosis and abdominal pain and tenderness which led to the diagnosis of appendicitis. A normal appendix was removed. Fever, abdominal discomfort and leucocytosis with a high percentage of eosinophiles persisted for months. Finally, pain became localized in the right upper quadrant of the abdomen and the liver began to enlarge. A second operation was performed. The liver was found to be nodular and an excised nodule proved at microscopical examination to have the characteristic structure of primary liver cell carcinoma. A little later the diagnosis was verified at autopsy. A short while ago, I saw a man over fifty years of age who complained of weakness, cough, and fever. He had been very thoroughly examined a few weeks before and no abnormality had been discovered except anemia and constant leucocytosis, 40,000 to 50,000, with a high percentage of eosinophiles. At this time a roentgenogram disclosed a beginning mass in the mediastinum and the diagnosis of Hodgkins disease was made. A little later the patient died and at post-mortem examination the mass proved to be a bronchogenic carcinoma. It is needless to multiply illustrations.

In the situation now before us the possibility of tumor must be entertained but after considering this possibility, I think you will agree that it is not likely to be the correct diagnosis. The evidence is against it rather than in its favor. In the first place the patient was only 26 years of age. Malignant growths occur at that age but not often and when they do they usually produce large tumors. Again, a very thorough examination of the abdomen made at operation failed to reveal the presence of a growth. Finally, the microscopical examination of the lymph node removed at operation showed no evidence of tumor.

Among the lymph node diseases that may resemble chronic infections are leucemia, lymphosarcoma and Hodgkins disease. It is not sufficiently realized that leucemia may for months cause fever with no or only slight enlargement of the lymph nodes and without characteristic changes in the blood. I recall a man of about seventy years of age who developed pericarditis with effusion and myocardial insufficiency. These manifestations gradually subsided and the patient seemed on the road to recovery when suddenly fever came on, the spleen enlarged, and the blood began to show the characteristic changes of leucemia. I recall too, and with embarrassment, a boy 12 years of age with fever, joint symptoms, and increase of the lymphocytes in the blood which was diagnosed as Malta fever. The autopsy demonstrated lymphoid leucemia. I can see no ground whatsoever to justify the diagnosis of leucemia in the case we are now discussing and refer to the possibility only as a caution that leucemia should always be considered in the diagnosis of obscure fever.

Lymphosarcoma seems to be just as unlikely a diagnosis as leucemia. In abdominal lymphosarcoma there is nearly always a tumor and usually a large one; enlarged retroperitoneal lymph nodes could hardly have been missed at operation, nor could lymphosarcoma of the intestinal wall; the mesenteric lymph node removed at operation did not show the characteristic structure of lymphosarcoma.

Hodgkins disease cannot be so lightly discarded for it is often accompanied by fever and its clinical manifestations are almost protean. Acute forms of abdominal Hodgkins disease occur which present the greatest difficulty in diagnosis. There may be diffuse infiltration of organs without discernible lymph node enlargement or other tumor. The character of the fever is often revealing, that is when it consists of bouts of fever alternating with intervals of normal temperature. In this form of Hodgkins disease the spleen is usually enlarged. Therefore many of the features of Hodgkins disease are absent and when we add to this the fact that the mesenteric node removed at operation showed none of the characteristics of Hodgkins disease this diagnosis may safely be discarded.

Our considerations up to this point lead us to the conclusion that the patient suffered from some infection and we must now turn our attention to a long list of infectious diseases. For the sake of convenience we may divide the list into two groups,

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first, those which we see infrequently, second, those which are more common and therefore better known.

In all cases of febrile disease which do not fit at once into some well known diagnostic category it is prudent to pause and consider the possibility that the symptoms may be due to some rare infection. During the past twenty years we have learned the importance, under these circumstances, of taking into account three diseases which we are gradually learning to recognize. They are not new diseases but only during the past few decades have they attracted attention. I refer to sarcoid, disseminated lupus erythematosus, and periarteritis nodosa. In the case now before us sarcoid at once may be discarded. Although it causes protean clinical symptoms, it is a relatively benign disease, lasts for years, and never appears as a severe, acute infection. Disseminated lupus is quite unlikely. It is true that the typical eruption may not appear but even so the symptoms are quite different from those displayed by this patient. As regards periarteritis nodosa, there is no characteristic clinical picture. The symptoms are so varied that one case shows little resemblance to another. Unless an excised bit of muscle shows characteristic microscopical lesions it is seldom possible to make a confident diagnosis. It is one of the most difficult of diagnoses and I must confess that I have shown little skill in recognizing the disease. When I do not make the diagnosis it is usually wrong; when I do not make the diagnosis autopsy may reveal it. Therefore I am willing to admit that this may be periarteritis nodosa though I think it is not. Pain is a very common symptom of periarteritis nodosa as is also gradually increasing involvement of the kidneys. Neither of these symptoms was present to a striking degree in the case we are discussing.

There remains then the group of more common infections. Many of these we may dismiss at once, namely, the typhoid group of infections and pyogenic infections. The symptoms were not those of these diseases and bacteriological studies were negative. A localized abscess could have been considered early in the course of the disease but not later after the illness had gone on for three months and no evidence of abscess had been discovered. That the illness could have been Malta fever is almost incredible. It must not be forgot that the patient had syphilis and that syphilitic infection often causes long continued obscure fever. However the clinical manifestations were quite different from those usually observed in syphilitic fever and the findings at operation are not compatible with that diagnosis.

Finally, the three infections that to me seem more reasonably to correspond with the clinical manifestations than any others are tularemia, tuberculosis and actinomycosis. It may seem odd to include tularemia among the three because the symptoms bear no resemblance whatsoever to the usual symptoms of tularemia. Nevertheless occasionally subacute forms of the disease occur which may go on for months and are difficult to diagnose. Not long ago there was such an instance at the Johns Hopkins Hospital which upon the wards was diagnosed Hodgkins disease but at autopsy tularemia.

When a young colored man is taken ill and dies after three months of a febrile illness the chances strongly favor the diagnosis of tuberculosis. This is the sensible diagnosis to make and there must be good reason for discarding it. In the case under consideration the chief objection to the diagnosis of tuberculosis is what was found at operation. The operation was performed about six weeks after the beginning of the illness and up to that time the only localizing symptoms had been abdominal. Had the illness been due to tuberculosis, then one would expect that at operation evidence of tuberculosis would have been found. Yet no such evidence was discovered. There was no tuberculosis of the organs, no tuberculous peritonitis, no tuberculosis of the excised mesenteric lymph node. This negative result makes the diagnosis of tuberculosis untenable.

We are left with actinomycosis. When I concider this diagnosis I must admit that the manifestations are far from characteristic of the infection. I have seen cases of actinomycosis diagnosed erroneously even at operation (once tuberculosis, on another occasion carcinoma) but I have never seen a picture just like this produced by actinomycosis. The duration of the illness in actinomycosis is longer; nearly always tumors form; and as a rule there is abscess formation. Nevertheless, in spite of these difficulties the condition seems to me to resemble actinomycosis more than anything else and though I am far from confident that this diagnosis is correct still it is the one that I prefer.

DR. ARNOLD F. STRAUSS, St. Vincent's Hospital, Norfolk: I shall report only the essential findings of the

autopsy. The body was that of a highly emaciated young negro and showed no external findings except a scar of a recent abdominal operation and a small one at the sulcus of the penis. Upon opening the abdominal cavity there were numerous adhesions in the region of the ascending and transverse colon. The mesentery and omentum were void of fat. The abdominal lymphnodes were slightly enlarged and pinkish on cut surface. The most striking findings were small whitish, rather firm nodes within the walls of the smaller arteries of the mesentery, which varied in size up to 0.5 cm. in diameter. Upon opening the cavity of the chest the fat tissue of the mediastinum was of gelatinous, yellowish gray appearance. The picture of the heart was most impressive. The coronary arteries appeared irregularly thickened by whitish nodes which frequently showed reddish centers. These nodes extended to twice the diameter of the arteries. The pericardial fat tissue had a peculiar appearance: it was stiff, yellowish gray and glistening upon cut surface, almost resembling amyloid. The spleen was not enlarged. On section, it showed a few dilated vessels with slightly thickened walls to which were adherent dark red firm blood clots. A few of the liver vessels had a similar appearance. The kidneys presented identical changes and, in addition, there were numerous yellowish white, triangular foci with red periphery, varying in size. The perirenal fat tissue resembled that of the epicardium but was a trifle gelatinous. The canaliculi of the testicles were adherent to each other.

The diagnosis was:

Periarteritis nodosa.

Nodular swelling, thrombosis and small aneurysms of the arteries of the heart, liver and kidneys. Multiple renal infarctions. Nodular swelling of the mesenteric arteries. *Microscopically:* Periarteritis nodosa of the spleen, pancreas, testicles with fibrosis of the last, of seminal vesicles and prostate, of the small arteries of the hilum of the lung, of the perirenal and adrenal fat tissue, of the muscles of the abdominal and chest walls with myositis (other muscles not examined). Myocardosis and pseudoscars of the myocardium.

Generalized chronic panniculitis and serous atrophy of the mediastinal, pericardial and epicardial fat tissue as well as of the perirenal and periadrenal fat tissue with peculiar stiffness of the latter. (*Microscopically:* no atypical amyloidosis of fat tissue.) Extreme emaciation. Generalized chronic lymphadenitis.

Terminal bronchopneumonia of the right lower lobe. Pulmonary edema and hypostasis. Chronic bronchitis and tracheitis. Chronic emphysema. Hydropericardium (100 cc.). Chronic esophagitis.

Ptosis of the transverse colon. Adhesions of liver and pyloric region of stomach, of spleen, transverse colon and omentum. Signs of former laparotomy and appendectomy (following statement about six weeks ago in Norfolk General Hospital). Scar of penis. Bilateral femoral hernia sacs.

Lundberg classified periarteritis nodosa into four more frequently observed clinical types:

First: fever, leucocytosis, marked emaciation and chlorotic marasmus.

Second: Polyneuritis and polymyositic symptoms.

Third: renal symptoms.

Fourth: abdominal symptoms.

The first picture is the most common. The next in frequency are cases with abdominal symptoms. Our case belongs to this group. The testicle which, at the onset of the disease, became swollen, showed marked periarteritic changes microscopically. The lungs which dominated the clinical picture during the final stage of the disease showed merely a terminal bronchial pneumonia.

During the abdominal operation the interest of the surgeon (Dr. W. A. Porter) was aroused by the unusual finding of oily fluid in the abdominal cavity, which has not been described in previous cases of periarteritis nodosa. The low blood cholesterol content of 117.6 mg. per cent may be worthwhile mentioning in this connection. This oily fluid had disappeared at the time of the autopsy and the peritoneal cavity was void of fat. There are two observations in the literature concerning change of human fat into oil, both cases with formation of granulomata in the mesentery. (Fleischmann, *Arch. Klin. Chirg.*, 158: 672; 1930 and Korsh, J. J., *Zentralblatt f. Path.*, 71: 337; 1938.) In each case there was a previous history of rheumatic fever which may be of interest as periarteritis nodosa has been considered as belonging to the group of rheumatic or hyperergic diseases. The microscopic examination of the fat tissue in our case showed, not only the picture of serous atrophy which we see occasionally in emaciating diseases, but there was also a diffuse chronic inflammation of the adipose tissue which was infiltrated by lymphocytes and, partly, by plasma cells. One could designate these changes as a generalized chronic panniculitis with serous atrophy. Since Kusmaul's and Mayer's first description of the disease in 1866, slightly over 30 cases were diagnosed during life and, of these, little more than a dozen were detected clinically without the help of the pathologist. Nodules along the arteries of the skin were the most helpful guides to the correct diagnosis. Most other cases were considered to be trichiniasis, rheumatic fever, miliary tuberculosis, typhoid fever, "surgical abdomen", appendicitis or cholecystitis.

Dr. Hamman, when leading us through the confusing history of this case, did not forget to take into account the possibility of periarteritis nodosa.

Fortunately, the second case that Dr. Whitehill selected seems to be much simpler than the first. The clinical records are as follows:

CASE 2.—M.W., a 26-year-old single colored female, was admitted to the Norfolk General Hospital on May 1, 1941, and died on May 15, 1941. The patient stated that she had been in good health until three

months before admission. At that time she began to have sharp substernal pains accompanied by a choking sensation and a sensation of rapid heart action. These attacks increased in frequency and duration, and at the time of admission lasted as long as several hours at a time. On occasions, following an attack, there was some swelling of the ankles. The patient's past health had been good. She had had pneumonia in childhood and the usual childhood diseases. She had not had joint pains, scarlet fever, diphtheria, or blood treatments. Her family history was non-contributory.

On admission her temperature was 96.8, pulse 135, blood pressure 98 systolic and 58 diastolic, and respirations 44. She presented the appearance of a fairly well developed and nourished colored female, lying quietly in bed and not acutely ill. The examination of the eyes, ears, nose and throat was normal. The pupils reacted to light and accommodation. There were several carious teeth. The tonsils were enlarged. There was some distention of the veins of the neck. The lungs were clear to percussion and auscultation. The heart was enlarged to the left. The heart sounds were of poor quality; the rate was rapid; there was a gallop rhythm at the apex. The point of maximal impulse was not palable. There were no murmurs. There was no accentuation of the heart sounds. There was no friction rub. No masses or viscera were palpable in the abdomen and there was no tenderness. The extremities were negative. There was no edema. The neurological examination was not remarkable. The hemoglobin was 84 per cent, the red blood cell count was 4,310,000 and the white blood cell count 8,000 with a normal differential count. The urine showed a specific gravity of 1.015, a trace of albumen, no sugar, and one or two pus cells. The first Wassermann test was anti-complementary, but a subsequent test was positive and the Laughlen test was positive.

During her stay in the hospital the patient's temperature was normal and subnormal. On one occasion it rose to 101. The pulse varied between 80 and 120 and the respirations between 20 and 30. On May 2nd an electrocardiogram showed a rate of 107, a PR interval of .17, a QRS interval of .07, and a normal sinus rhythm. There was left ventricular preponderance. The T waves were isoelectric in Lead I, diphasic in Leads 2 and 3, and inverted in Lead 4. The impression was that the tracing showed sinus tachycardia and some evidences of myocardial damage. Fluoroscopy of the chest showed that the lung fields were clear. The heart shadow was greatly enlarged to the left. Right sided enlargement was only moderate in extent. The cardiac pulsations were forceful, both on the right and left, but the aortic and pulmonary conus pulsations were not. The retrocardiac area was encroached upon by the hypertrophied cardiac shadow. On May 8th the venous pressure was 139 mm. of saline and on May 14th it was 165 mm. The patient continued to have spells of dyspnoea and tachycardia while at rest in bed. With them she complained of substernal choking. On May 3, 1941, there was heard a loud musical sound over the entire precordium. It varied somewhat with respiration and position. Its exact significance was not determined but it was thought to be a pericardial friction rub. Because there was some history of poor dietary habits the patient was given thiamin hydrochloride, 60 mgm. intravenously for several days. At first it was believed that there was some improvement but it was found that this was only temporary and the medicine was stopped. She was also treated with quinidine sulfate. On May 15th during a spell of dyspnoea and rapid heart action the patient suddenly expired.

DR. HAMMAN'S DISCUSSION

It is clear enough that this patient suffered from heart failure. In attempting to diagnose the disease of the heart to which failure is due I have found it helpful to begin the analysis by deciding into which of six groups of heart disease the case belongs. The six groups are valvular heart disease, hypertension in the general circulation, hypertension in the pulmonary circulation, pericardial disease, congenital defects, and myocardial disease. In the case that now demands our attention, it is plain that it must have been disease of the myocardium for there is no evidence of valvular disease, of hypertension in the general or pulmonary circulation, and pericardial disease or of a congenital defect. Perhaps we should pause to consider pericardial disease because during the last few days of life a peculiar musical sound was heard over the heart which some observers considered to be a pericardial friction. From the description of the sound one is justified in doubting the diagnosis of pericarditis for certainly this is not the description of a pericardial friction. Moreover, should the post-mortem examination unexpectedly demonstrate that the patient did have pericarditis then I am sure the pericarditis will prove to have been a terminal complication and not the cause of the heart failure. Therefore we may safely assume that myocardial disease underlay the heart failure and it will be our problem to decide upon the nature of the myocardial disease. However, before attacking that problem we will pause to consider certain prominent clinical symptoms that were present because the explanation of the pathological physiology of these symptoms will have a critical bearing upon our decision as to the nature of the myocardial disease.

It has not escaped your attention that during this patient's illness the most prominent, the most srik-ing symptom was pain, recurring attacks of severe

pain about the heart, and that the patient died not slowly of heart failure but suddenly during one of the attacks of pain. These striking symptoms are the characteristic symptoms of disturbance of the coronary blood flow, the disturbance being caused by a mechanical obstruction of the coronary arteries. This obstruction, so plainly indicated, must be due to arteriosclerosis of the coronary arteries or to syphilitic aortitis sealing over the mouths of the coronary arteries. All the evidence favors the view that the patient had syphilitic aortitis with partial occlusion of the mouths of the coronary arteries. The positive Wassermann reaction demonstrates that the patient had syphilis and her age, 26 years, makes it altogether unlikely that she had extensive sclerosis of the coronary arteries.

If we accept the diagnosis of syphilitic aortitis encroaching upon the mouths of the coronary arteries then the problem of deciding upon the nature of the myocardial disease is a relatively simple one. The changes in the heart muscle must be due to interference with the coronary blood flow, leading to death of muscle fibres by lack of nourishment and oxygen, or to syphilitic myocarditis, or to a combination of these two. It is unusual in syphilitic aortitis, when there is no aortic insufficiency, to find the heart greatly enlarged. As the mouths of the coronary arteries are encroached upon the sealing over of the orifice proceeds very slowly, allowing sufficient time for an abundant collateral circulation to develop so that if at the end one artery becomes completely occluded a large myocardial infarct is not produced. Dilatation and hypertrophy of the walls of the heart may occur without there being a large infarct when many muscle fibres degenerate and die for want of sufficient nourishment and oxygen. However, as I have said, under these circumstances usually the heart does not become so large as it was in this patient. The size of the heart leads me to suggest that in addition to syphilitic aortitis encroaching upon the mouths of the coronary arteries there is also syphilitic myocarditis.

DR. L. J. MOTYCA, Norfolk General Hospital, Norfolk: A summary of the pertinent autopsy finding is as follows: The autopsy was restricted to the chest. The heart was much hypertrophied and dilated, the right side being more dilated than the left. The apex lay at the level of the seventh rib. The orifice of the right coronary artery was completely occluded by scar tissue. Distal to this point, the artery was patent and free of lesions. The left coronary artery was not remarkable. The wall of the left ventricle was slightly thickened and beefy red in color. It was softer than normal in places, and these areas were marked by hemorrhagic streaks. The wall of the left ventricle was thickened, but otherwise normal, both grossly and microscopically. A microscopic examination of the wall of the right ventricle revealed a separation of muscle fibers by streaks of blood. Near the endocardium, the fibers were swollen and frayed. Some of them were replaced by fibrous tissue in which there was a slight infiltration of lymphocytes. One of these foci was highly vascular. There was a typical thrombus attached to the endocardium. The hemorrhagic areas represent a very recent lesion, while the fibrous areas represent older ones. The valves of the heart were normal. The aortic ring had a circumference of 7 cm. The aorta was dilated above the ring and the intima was marked with typical luetic plaques. Microscopic sections revealed a heavy infiltration of lymphocytes in the adventitia, degenerative foci in the media, and lesser changes in the intima. Both lungs were congested and edematous.

Anatomical and Microscopic Diagnosis: Cardiac hypertrophy and dilatation; syphilitic aortitis; occlusion of the orifice of the right coronary artery; early infarction of the right ventricle; small mural thrombus of the right ventricle; pulmonary congestion and edema, and fibrous pleural adhesions.

THE NEURO-SURGICAL MANAGEMENT OF EPILEPSY*

J. M. MEREDITH, M.D.,†
Richmond, Virginia.

INTRODUCTION

The term "epilepsy" is no more a diagnosis than are the words headache or vertigo, i.e., it is merely a symptom of disease and may be due to many different causes. The neurological surgeon in dealing with the problem of convulsions is particularly concerned with patients who have generalized or localized (Jacksonian) convulsions usually associated with loss of consciousness. The majority of patients with convulsions do not have a surgical

*Amplification of a paper read before the Surgical Section at the annual meeting of the Medical Society of Virginia, Virginia Beach, October 8, 1941.

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lesion, but there remains a certain significant group who do have organic disease of the brain of one type or another that is susceptible of operative attack, and it is with this group that we are especially concerned in this discussion.

As stated by Spurling,[1] "With the introduction of pneumo-encephalography by Dandy in 1919, the study and treatment of organic cerebral disorders received a tremendous impetus." We believe that every patient who has convulsions should be subjected to an encephalogram (if there are no signs of increased intracranial pressure), or to a ventriculogram if there are evidences of such pressure. In many patients, without an air injection, it is impossible to state (1) whether or not a *surgical* lesion is causing the convulsions, or, (2) exactly where in the brain such a lesion is located, as the cases to be cited will demonstrate. In the epileptic patients in whom air injections show no *surgical* lesion, dehydration, anti-convulsant drugs, and, when indicated, a subsequent air injection, are the best and accepted methods of management.

There are six major causes of surgical epilepsy: (a) congenital, (b) neoplastic, (c) inflammatory, (d) post-traumatic, (e) vascular, and (f) degenerative brain lesions. Examples** of each type will be given.

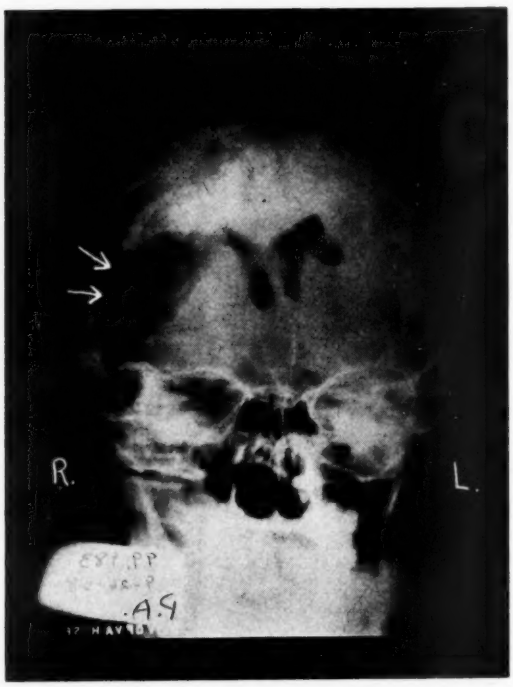

Fig. 1.—Case I (Congenital). Encephalogram demonstrating a porencephalic cyst (arrows) communicating with the right lateral ventricle and deflecting the entire ventricular system toward the right side.

(a) *Congenital:* (1) F. C., a seven-year-old white boy had had attacks of mental confusion with transient unconsciousness. Convulsions had occurred at the time of birth. An encephalogram showed a large right cerebral porencephalic cyst communicating with the ventricle and extending to the cortex (Fig. 1). At operation, the cyst was found in the right temporal lobe covered only by arachnoid. The cyst wall was excised together with a large adhesion holding it firmly to the under surface of the dura (Fig. 2). The child has since done very well with no convulsions occurring in the three years that have elapsed since operation.

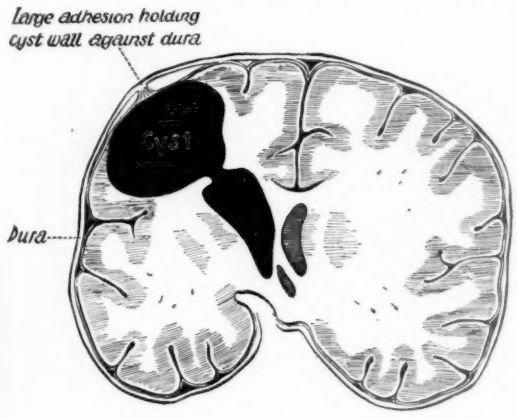

Fig. 2.—Case I (Congenital). Artist's drawing showing, particularly, the large dural adhesion holding the cyst (which communicated directly with the ventricle) tightly against the under surface of the dura, undoubtedly producing undue traction on the brain with resultant convulsive seizures.

(2) D. S., a sixteen-year-old white boy, had had generalized convulsions for one and a half years before admission, chiefly on the left side. The left hand had been weak since the age of three months. Examination disclosed a spastic weakness of the left side of the body with an ankle clonus and a positive Babinski sign on that side. An encephalogram showed that the right lateral ventricle was deflected (by traction) toward the surface of the right cerebral hemisphere (Fig. 3.) At operation, there was definite over-vascularization of the entire

**All the cases cited in this paper were treated in the Department of Neurological Surgery at the University of Virginia, Charlottesville, during the writer's tenure at that institution (1937-41).

right cerebral hemisphere and a large subarachnoid cyst (not directly connecting with the ventricle, but filled with fluid and overlying a considerable portion of the right temporal lobe) was disclosed. The cyst was evacuated and excised, and the patient has since been free of convulsions, about twenty-five months having elapsed since operation.

Fig. 3.—Case 2 (Congenital). Encephalogram demonstrating the enlarged right lateral ventricle (arrows). At operation, the subarachnoid cyst was not communicating with this ventricle.

(b) *Neoplastic:* (1) C. S., a sixty-nine-year-old white woman, complained of tingling of the left side of the face and hand for two years together with left-sided convulsions for four years before admission. Examination showed complete astereognosis of the left hand with a slight left lower facial weakness. The optic disks were normal. A ventriculogram (because of the patient's age rather than an encephalogram as might have been done in a younger patient) showed a marked shift of the ventricular system to the left side consistent with a right temporo-parietal glioma (Fig. 4). Immediate operation disclosed a solid glioblastoma (Dr. C. R. Tuthill) in the right temporo-parietal region which was subtotally removed. Post-operative x-ray therapy was given, and the patient has since been free of convulsions so far as is known (ten months after operation), except for two light seizures which occurred while x-ray treatment was being given during her post-operative convalescence in the hospital.

Fig. 4.—Case I (Neoplastic). Ventriculogram demonstrating marked displacement of the ventricular system to the left side by a right cerebral glioma which caused left sided (Jacksonian) convulsions.

(2) C. S.,* a fourteen-year-old white boy, had had ten convulsions during a period of ten months before admission, beginning on the right side of the body, then becoming generalized and associated with unconsciousness. He had severe morning vomiting with frontal headache together with transient diplopia and blurred vision. Examination showed a high degree of bilateral choked disks (five to six diopters of choking) and slight weakness of the right hand. A ventriculogram showed a tremendous shift of the ventricular system toward the right side, and immediate craniotomy disclosed a large cyst occupying a considerable portion of the left cerebral

*This case was briefly referred to by the writer in a previous paper (Unusual Tumors of the Brain, etc.) *Virginia Medical Monthly*, 68:319-29. June, 1941 (Footnote of Case IV).

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hemisphere on the superior surface of which was a tumor nodule (Fig. 5), diagnosed (Dr. C. R. Tuthill) as a malignant type of meningioma apparently arising from the vessels of the leptomeninges, although the morphological characteristics of the tumor cells also resembled those seen in fibro-sarcoma of the meninges. The patient has since remained free of convulsions, twenty-five months after operation, no post-operative x-ray therapy having been given to date. The optic disks are now normal.

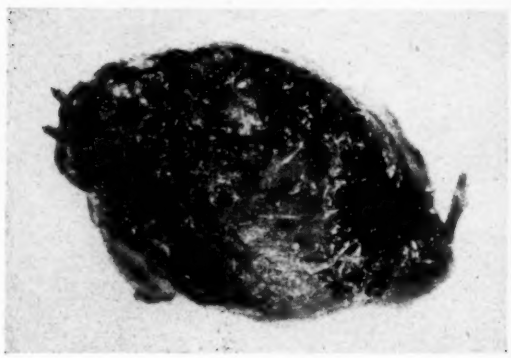

Fig. 5.—Case 2. (Neoplastic). Photograph of the actual tumor nodule removed from the large left cerebral cyst. The nodule weighed 1.51 grams, and the measurements were 2x1x5x1 cms.

(c) *Inflammatory:* (1) R. R., an eighteen-year-old white boy, complained of severe headache for one week before admission associated with grand mal seizures. There was a history of severe sinus disease for three years previous to admission. On examination, the pulse was fifty-six per minute, and the patient was very stuporous. The optic disks were hazy in outline. There was a positive Babinski sign on the left side. At operation a large right frontal lobe abscess was encountered and drained, from which a staphyl. albus hem. was cultured. A gutta percha drain was left in situ for three weeks and sulfanilamide* administered. The patient recovered and has since been free of convulsions for two years after operation.

(2) L. C., a nineteen-year-old white girl, had had left-sided convulsive seizures associated with unconsciousness for thirteen years before admission, beginning three years after a severe attack of meningitis at the age of three years, during which the child was quite ill with a temperature of 105°-106°.

*Sulfadiazine was not available at the time this patient was treated and would now be the drug of choice for staphylococcic infections of the brain.

An encephalogram showed an obliterative arachnoiditis involving the right cerebral hemisphere with no shift of the ventricular system (Fig. 6). A right-

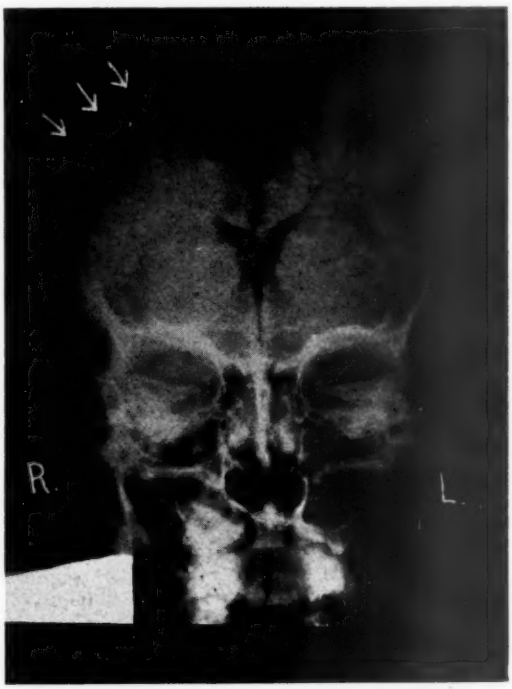

Fig. 6.—Case 2 (Inflammatory). Encephalogram showing very little air (arrows) in the subarachnoid spaces over the right cerebral hemisphere (obliterative arachnoiditis), undoubtedly caused by the severe meningitis which had occurred sixteen years before the air injection was performed, resulting in left sided convulsions.

sided craniotomy was performed. The brain appeared very firm, resembling one that had been hardened in formalin. The arachnoid was very adherent to the underlying cortex except for an occasional pocket of fluid in the sulci. These pockets of fluid were opened widely, and a moderate-sized decompression incorporated in the bone flap. The patient has since improved both with respect to the number and the severity of the convulsions during a thirty-month period after operation, but they have continued at intervals and a cortical ablation of a portion of the right motor or pre-motor area may be necessary to effect a cure.

(d) *Post-traumatic:* (1) J. R., a white man, aged twenty-nine, complained of numbness and involuntary movements of the left arm for two weeks before admission, occasionally associated with unconsciousness. Six years before admission he had

been struck on the right side of the head by a policeman, sustaining a depressed fractured skull. Operation elsewhere resulted in a skull defect in the right temporal region. A few days before onset of the left-sided seizures, he had received another blow over the right frontal region near the old decompression. An encephalogram showed an enlarged right lateral ventricle with a very slight shift of the entire ventricular system toward the right side (Fig. 7). At operation, the old decompression

Fig. 7.—Case I (Post-Traumatic). Encephalogram demonstrating the enlarged right lateral ventricle (arrows) with very slight deflection of the ventricular system toward the right side due to traction by a right fronto-temporal (cerebral) scar.

in the right fronto-temporal region was enlarged, and a dense scar was dissected out from the right cerebral hemisphere extending down to the wall of the right lateral ventricle (Fig. 8), but it was not necessary to open the ventricle itself. The patient has since been free of all seizures, almost three years having elapsed since operation.

(2) E. B.,* a thirty-one-year-old white man, had

*This case has been previously reported in greater detail by the writer in describing an operative procedure for certain post-traumatic and post-inflammatory lesions of the brain causing epilepsy (*Southern Surgeon*, 9:86-95, February, 1940).

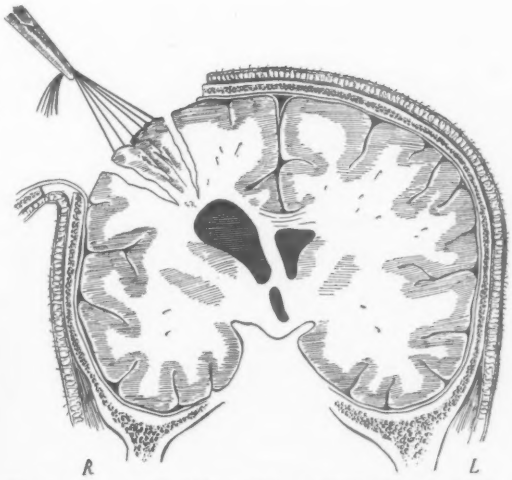

Fig. 8.—Case I (Post-Traumatic). Artist's drawing demonstrating mobilization of the right cerebral scar preliminary to excision. The scar extended almost to the right lateral ventricle.

had several entirely generalized convulsions at least once or twice monthly for twenty-eight months before admission (in spite of large daily doses of anticonvulsant drugs), beginning for the first time two years after a severe brain injury at which time he was unconscious for at least eight hours and bled

Fig. 9.—Case 2 (Post-Traumatic). Encephalogram demonstrating marked enlargement of the entire ventricular system with very little air in the basilar cisternae, especially the posterior group (arrows).

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from the right ear (basilar skull fracture). Two encephalograms after the convulsions developed had shown marked enlargement of the ventricular system (Fig. 9) with very little air in the basilar cisternae, i.e., internal hydrocephalus and basilar (obliterative) arachnoiditis. On the supposition that the creation of a direct stoma between the ventricular system and the cortical subarachnoid spaces—thus short-circuiting the flow of cerebro-spinal fluid around the blocked basilar cisternae, together with an excision of the choroid plexus in the lateral ventricle (to reduce the amount of cerebro-spinal fluid formed) utilized for the stoma—would reduce or eliminate the convulsions, such a procedure was carried out (Fig. 10), and the patient has since been

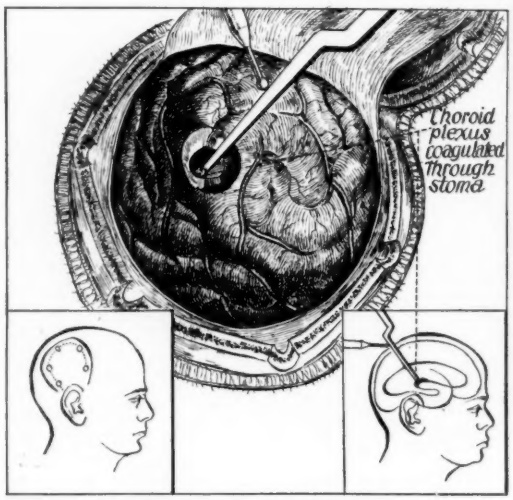

Fig. 10.—Case 2 (Post-Traumatic). Artist's sketch of the operation pe formed. This consisted of the formation of a stoma which directly connected the right cerebral cortex and the right lateral ventricle together with an electrocoagulation of the choroid plexus in that ventricle, resulting in complete elimination of the convulsions in this patient, to date. No anti-convulsant drugs are required.

entirely free of all convulsions for three years without the use of anti-convulsant drugs. He works daily in the coal mines in a neighboring state.

(e) *Vascular:* (1) R. F., a white boy, aged eleven years, complained of monthly left-sided convulsions for three years before admission, beginning suddenly while swimming. Examination showed marked spastic weakness of the left side with no signs of increased intracranial pressure. X-ray films of the skull showed heavy venous markings throughout, especially in the right parieto-frontal region near the midline (Fig. 11), consistent with a diagnosis of angioma. At operation, a large venous angioma, almost completely covering the cortex (Fig. 12) was found overlying the right motor area, and a number of the peripheral vessels were coagulated with the electro-surgical apparatus. X-ray therapy was given post-operatively. Only a single convulsion has occurred in the more than three years that have elapsed since operation.

Fig. 11.—Case 1 (Vascular). Right lateral X-ray film of the skull demonstrating, especially, the erosion of the entire thickness of the skull (arrows) at the site of the venous angioma causing Jacksonian convulsions of the left side of the body.

(2) J. S., a thirty-nine-year-old white man, had had convulsions at intervals for five years. A few days before admission he began to have very severe left-sided seizures which, the day before operation, occurred every five to ten minutes, involving only the left arm and face. The spinal fluid pressure was 230 mm. of water, and the spinal fluid was definitely xanthrochromic. A right subtemporal decompression was performed as an emergency procedure one night, and a venous angioma found involving especially the temporal lobe and extending into and over the surface of the right frontal lobe as well. Furthermore, when the dura was opened, rather bright red fluid was encountered; undoubtedly quite recent subarachnoid and subdural bleed-

ing had occurred from the angioma, thus accounting for the very frequent left-sided seizures. All bleeding points on the cortex were controlled with the electro-surgical apparatus, warm saline solution irrigations and muscle implants. The patient has since been free of convulsions during a twenty-one-month period after operation, being able to resume his work as a machinist.

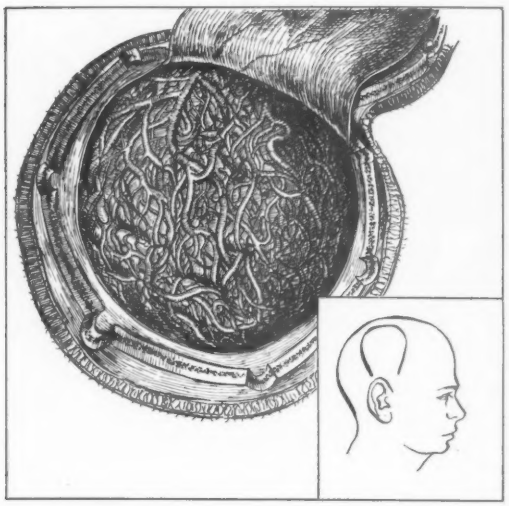

Fig. 12.—Case 1 (Vascular). Artist's drawing of the operative appearance of the venous angioma covering the greater portion of the right cerebral hemisphere to such an extent that cortex was scarcely visible. The larger vessels were coagulated and post-operative X-ray therapy administered, resulting in practically complete subsidence of the convulsions to date.

(f) *Degenerative:* (1) C. S., a white man, aged fifty-two, had generalized convulsions for two years before admission, beginning on the left side of the body. There were no signs of increased intracranial pressure; the blood pressure was 105/70. There was a questionably positive Babinski sign on the left side. A ventriculogram showed that the lateral ventricles were well filled, with the right one somewhat larger than the left and possibly deflected somewhat to the right (Fig. 13). It was concluded that the patient had degenerative cerebral disease (secondary to a previous thrombosis) of the right cerebral hemisphere with subsequent right ventricular enlargement and no further operation was carried out. Efforts to determine (by letters) whether the patient has had any further convulsions, since the ventriculogram was done fifteen months ago, were unavailing at the time of writing.

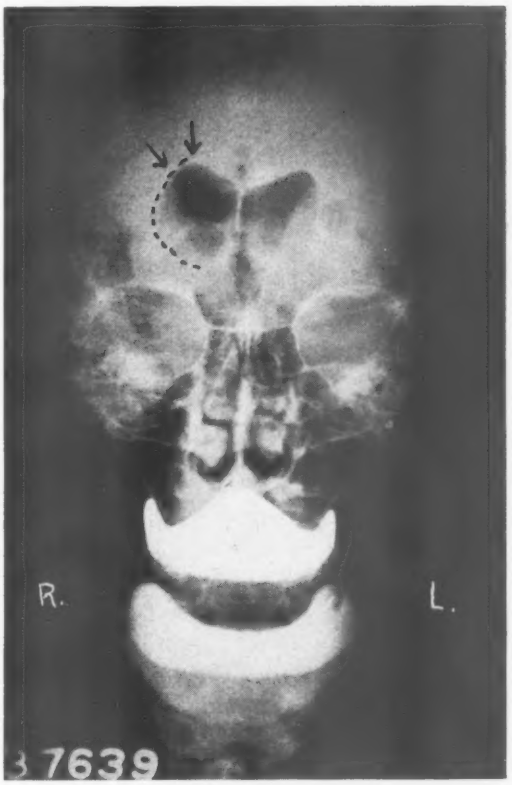

Fig. 13.—Case I (Degenerative). Ventriculogram demonstrating the rounded enlargement of the right lateral ventricle (arrows) which characteristically follows a previous cerebral thrombosis on the same side of the brain, resulting, in this case, in left-sided convulsions, closely resembling (clinically) those due to a tumor or other mass lesion.

THE VALUE OF ELECTRO-ENCEPHALOGRAPHY IN THE DIAGNOSIS OF PATIENTS WITH SURGICAL LESIONS OF THE BRAIN CAUSING CONVULSIONS

As the Drs. Gibbs and Lennox[2] have shown, convulsions are associated with paroxysmal cerebral dysrhythmia. Through the illuminating work of Berger, it has been demonstrated that many epileptogenic lesions, tumors, and certain psychoses will produce characteristic abnormal waves in the electro-encephalogram. Such a case has been recorded by Goldensohn, Marmor, and Myer[3] who successfully localized a cerebral cyst by electro-encephalography alone; after operation, the epileptogenic focus had disappeared in the electro-encephalogram, and no further seizures had occurred up to the time of their report.

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For the last few years, electro-encephalograms have been performed on a considerable number of the neuro-surgical patients and on an even larger number of neuro-psychiatric patients at the University of Virginia Hospital (Charlottesville) by Dr. C. G. Holland, Jr., now of Philadelphia, but for the last few years a member of the Department of Neuro-Psychiatry at the University of Virginia. He has kindly permitted us to quote from his present views on this important subject;[4] in the main, they correspond to the writer's own opinion concerning the value of the electro-encephalogram to the neuro-surgeon:

The electro-encephalogram will practically always localize a *cortical* lesion, whether it is above or below the tentorium, but it will not show whether it is of *surgical significance* or not, i.e., it is just as apt to show abnormal waves overlying cerebral softening and gliosis due to a cerebral thrombosis as it will with tumor. It repeatedly has localized cerebellar and cerebral tumors for us in doubtful cases (as to clinical localization) with disappearance of the electro-encephalographic focus after operation. The electro-encephalogram frequently fails to localize *subcortical* tumors or other mass lesions below the cortex wherever they may be in the brain. An electro-encephalographic focus demonstrated in a patient with *generalized* convulsions (in whom a pneumo-encephalogram fails to show a significant lesion) will usually prove to be of little importance if operation is carried out over the suspected site (as demonstrated by the electro-encephalogram) and only indifferent post-operative results are to be expected in such cases, particularly with respect to the subsequent elimination of the convulsions, unless quite radical procedures, such as an ablation of the motor cortex, are performed. As emphasized by Dr. Holland, the electro-encephalogram is only one of the many diagnostic aids to be used in the investigation of epileptic patients, and is, in no manner, to be considered a substitute for the all-important air injections which are almost invariably carried out before operation in patients with convulsive disorders. (Occasionally, in the individual case, the convulsions are so localized or the plain x-ray films may show a lesion so logically situated that pre-operative air injection is unnecessary).

SUMMARY

(1) There are six major causes of surgical epilepsy. Examples of each are given together with the operative findings and the post-operative results.

(2) A brief note is added concerning the value of the electro-encephalogram in the localization and diagnosis of the essential lesion in any individual case of epilepsy.

N. B. The writer wishes to acknowledge the aid of the Department of Roentgenology at the University of Virginia (Dr. V. W. Archer, Director) in the interpretation of the X-ray films of the cases reported in this paper.

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4. Personal Communication to the writer from Dr. Holland (September 26, 1941).

1200 East Broad Street.

DISCUSSION

DR. C. C. COLEMAN, Richmond: A great deal more could be said about the surgical treatment of epilepsy or convulsions than it was possible for Dr. Meredith to say in the length of time he had at his disposal. Something, of course, should be said against many of the surgical procedures which have been advocated for the cure of epilepsy from time to time but which have been proved completely useless.

Dr. Meredith's paper shows that in adults, particularly, one must be on the lookout for a localized lesion which is responsible for convulsions. This is the theme of the paper. The appearance of convulsions in adults without a definite history indicating a cause for such attacks, requires that the patient be studied for the possibility of brain tumor. Careful neurological examination usually with ventriculography or encephalography should be carried out.

We have had a large number of cases of convulsions in children and in the investigation of these cases we have usually made encephalographic studies. I must say that the number of surgical lesions disclosed in children with convulsions is exceedingly small and the routine use of encephalography for disclosure of such lesions would hardly be justified. However, I think encephalography in such cases is very important for one particular reason. Parents of children with convulsions are rarely satisfied with opinions based on clinical study alone. They may go from clinic to clinic in a futile quest for relief of the convulsions. With the combination of clinical and encephalographic study it is possible to demonstrate precisely a localized lesion when such is present or to exclude the presence of a surgical lesion. It is

very important to be able in these cases to speak with all the available information, and to do this encephalography is usually required.

DR. D. C. WILSON, University: Dr. Meredith's paper was enjoyed by us all. Certainly it was an excellent presentation of the subject; his classification is quite good and results splendid.

The problem of epilepsy is a very large one and there are many other points of interest besides the strictly neurosurgical one. In the Neurological Department of the University of Virginia Hospital we are especially interested in the idiopathic or habitual epilepsy, which is a much greater group than the post-traumatic or those with definite surgical lesions. We are, therefore, especially interested in the new type of surgical venturing into the idiopathic field. Penfield and Forster have localized certain epileptogenic areas in the cortex by studying the aura, by studying the scars in traumatic cases, and by means of an electric needle have mapped off from the cortex foci for different types of convulsions. By means of this diagram an attack can be studied; then the cortex exposed, electric stimulus applied to the area of cortex which responds to the attack, and then if an identical attack is produced the surface of the cortex can be removed. This has given gratifying results in some few cases. With Dr. Meredith's permission, I am going to demonstrate with a movie this procedure.

This subject, a girl, had whooping cough which was followed by continuous petit mal convulsions. Everything was tried with no avail; air injection showed no abnormality, but there was a definite aura. We then did an electroencephalogram and found a focus somewhere near the expected source of such an aura. Cortex was then exposed and a portion removed, as shown in the movies.

DR. MEREDITH, closing the discussion: I want to thank the discussers for their interesting and helpful comments. The points that Dr. Coleman has made are very well taken. When adults develop convulsions of the generalized or of the Jacksonian type, it is best to assume, especially if the patient is thirty years of age or older, that a mass lesion of the brain (tumor, cyst, abscess, etc.) is present until or unless it has been rigidly excluded by an encephalogram or ventriculogram, depending upon whether or not there are clinical signs of increased intracranial pressure present, the encephalographic procedure being reserved, in our clinic, for those patients in whom such signs (of increased pressure) are absent. On the other hand, the majority of cases of convulsions in *children* are not of surgical significance, but air injection should always be done in such individuals also, fairly soon after the convulsions develop, rather than to proceed with dehydration and medicinal therapy for a long period of time when a surgical lesion may possibly be the cause of the seizures. Every additional convulsion that a patient has, at whatever age, makes the case that much harder to cure, even though a completely removable mass lesion is eventually demonstrated and surgically eradicated.

Dr. Coleman also referred to the problem of the prevention of convulsions from a surgical standpoint which is a very important subject. Eugenically, as well, it has been shown by the Drs. Gibbs and others, by means of the electroencephalogram in parents, that it can be predicted in a great many instances which couples' children will, quite possibly, develop convulsions later on in life. With a husband or wife, or both, perhaps not having convulsions themselves, yet have fairly close relatives who do have them, the wisdom of such a couple having children is open to serious question. These latter statements, of course, refer chiefly to the so-called "idiopathic" type of convulsions (epilepsy) occurring in children, and not, usually, of surgical significance.

Dr. Wilson mentioned the work of Dr. Penfield and Dr. Forster and showed an interesting motion picture of an operation in a child with convulsions operated upon by Dr. W. G. Crutchfield. This also served to emphasize that, even though an air injection may not demonstrate any significant surgical lesion, there may be *selected* cases in which, it is hoped, *cortical ablation* (the cerebral location of which having been determined both by the clinical epileptic pattern and the electro-encephalographic tracings) will eliminate or greatly reduce the severity and (or) the number of convulsions.

OUR HEALTH, YESTERDAY AND TODAY

A Study of Acute Otitis Media and Mastoiditis and Their Relation to Public Health*

JOHN F. WOODWARD, JR., B.S., M.D.,
New York City.

Were all men built from the same pattern so that they responded to physical agents or bacterial infection in regular fashion, the practice of medicine would be a simple business. Human beings, however, are like contrary women of whom the comedian sang: "You never saw two alike any one time and never saw one alike twice."[15]

This variability of individuals is a vital factor in the comparison of our health today with that of two or three decades ago. Interesting as it may

*Presented before the Norfolk County Medical Society, Norfolk, Va., January 12, 1942.

be, a true scientific comparison is not possible. Nevertheless, we have certain data that may help us in our ever searching efforts to improve our health.

Heredity and environment play important roles. In environment we include all external circumstances, both physical and social. Climate, age, time or season, sex, occupation, habits, diet, allergies, general physical condition, response to treatment, geography and economical status are all important. They must be carried in the background of any discussion regarding the trend of various diseases.

The individual response to diseases, in the field of otolaryngology, presents many variable points in relation to the above facts. Acute otitis media and mastoiditis are practically always secondary infections. They are dependent upon a primary infection of the upper respiratory tract. There is usually present a preceding systemic infection from which there are local manifestations in the rhinopharynx. The source of the infection lies in the blood and lymph channels of the adjacent mucosa, the true origin of the infection being the mucosa of the upper respiratory tract.[9] I hope a comparison of these infections with their related primary infectors and the numerous factors involved, may lead us to some conclusions as to the trend of our health.

Let us review briefly the bacteriology of acute otitis media and mastoiditis. Altman's[1] report on 1555 cases of mastoiditis in persons up to 30 years of age, was 81 per cent of streptococcus hemolyticus. The percentage of different organisms present may vary in different localities, both in this country and throughout the world. "Taylor, at Jacksonville, has the impression that the bacteriology of the east coast of Florida is similar to that of the North. Brown reports 66 per cent streptococcus in mastoiditis in Atlanta. Colemore, of San Juan, reports that the predominating organism in upper respiratory infections in Puerto Rico is a staphylococcus."[7] The predominating organism is generally the streptococcus, with the pneumococcus and the staphylococcus following pretty closely.

Figure 1, by Fowler,[7] shows these differences clearly. However, in considering the different percentages, it is necessary to remember that the higher percentage of hemolytic streptococci were found in cultures of the mastoid cavity, as compared with those of Page and Fowler in New York City, taken from acute ears.

PERCENTAGE OF DIFFERENT ORGANISMS IN OTITIS MEDIA AS GIVEN BY VARIOUS AUTHORS

	Hæm. strep.	*Other strep.*	*Pneumo. III*	*Other pneumo.*	*Staph. (all)*	*Others*	*No. growth*
Vaheri, Helsinki, Finland, 1932-6, 200 acute mastoids	68.5	0.5	24.0	3.0	1.5	2.5	--
Altmann, Vienna, Austria, 1926-34, 1,457 acute mastoids	66.2	--	18.7	10.9	--	4.2	--
Kreutz and Witter, Detroit, 1926-36, 300 acute mastoids	63.0	8.0	5.0	2.0	9.0	4.0	9.0
Inutsuka and Kumami, Japan, 1914-35, 414 acute mastoids	30.1	18.5	21.4	10.7	2.6	17.7	--
Wirth, Heidelberg, Germany, 211 acute ears	44.4	1.8	20.0	19.9	7.7	6.2	--
Dunlap, Peiping, China, 1920-5, 488 unclassified	34.7	4.2	0.8	0.5	33.5	26.3	--
*Fowler, New York City, 1933-9, 2,755 acute ears	33.6	2.7	6.4	11.1	36.7	9.5	--
Page, New York City, 1933-4, 836 acute ears	30.1	2.1	13.9	0.3	22.4	7.9	23.3

Figure 1.

Three times as many mastoidectomies follow spontaneous rupture of the tympanic membrane as follow myringotomy, according to Page[13]. Remembering this, Figure 2 shows a graph made from the

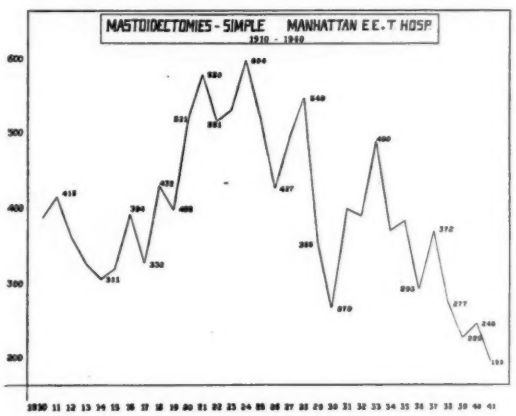

Figure 2.

acute simple primary mastoidectomies performed at Manhattan Eye, Ear and Throat Hospital from 1910 through 1941.

A glance at the graph over this period shows many

high and low points, with the all time high occurring in 1924 and the low in 1941. Dividing the graph into 10 year periods shows the largest number performed during the second decade from 1920 through 1930, with a considerable drop from 1928 to 1930. A similar fall may be noted beginning in 1937. This was the year that chemotherapy appeared on our professional horizon. Are these points significant? What causes these yearly changes? Bear this graph in mind for I shall try to answer these questions later.

Now, in Figure 3 we see the number of myringo-

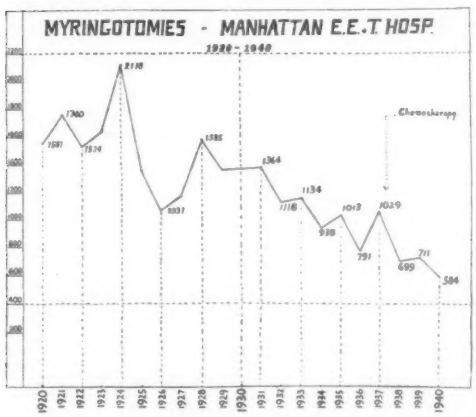

Figure 3.

tomies performed over a twenty year period. Here the high point occurred in 1924, with a more gradual falling off to the low in 1940. Let us superimpose these two graphs as may be seen in Figure 4. Here

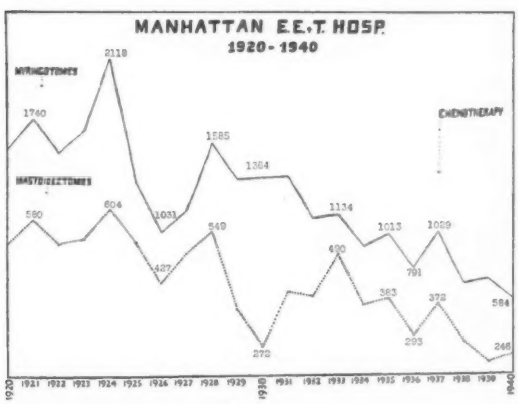

Figure 4.

the scale of the mastoid graph has been increased proportionately in order to bring out more clearly the peaks. It is easy to see at a glance that the two graphs follow closely, with the high point occurring in 1924 and the low in 1940. They do not follow in 1929 and 1930, but the trend from 1920 through 1940 seems to run about the same.

These graphs are from one special hospital in one section of the country. It should be interesting to examine what has been occurring throughout the United States. Figure 5, from the study by Corya,

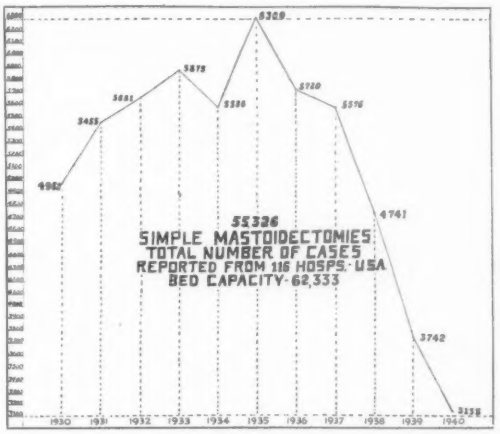

Figure 5.

shows a graph of 55,326 simple mastoidectomies reported from 116 hospitals covering an eleven year period. This composite picture represents cases from the New York Metropolitan area, the New England States, the Middle Atlantic States, the Southern States, the Middle Western States, the Pacific and the Rocky Mountain States. Although there are naturally variances from year to year, the general trend seems similar to the previous picture with a more pronounced drop beginning in 1935 to a low again in 1940.

I repeat, acute middle ears and mastoiditis are secondary infections, dependent upon the numerous diseases of the upper respiratory tract. Then let us look at some of these diseases for a possible cause.

It has been estimated that eight million cases of eight diseases—measles and rubella, chicken pox and small pox, diphtheria and scarlet fever, mumps and whooping cough—occur in the United States yearly.[19] The average American at 20 years of age has had at least three of these infections and there are approximately 48 million children in the United States. Add to this cases of acute colds, influenza

and pneumonia, in all age groups, and we find an appalling number of primary infectors.

We know that measles is due to a filtrable virus. The complications, which affect chiefly the upper respiratory tract, are secondary infections. However, acute otitis media preceding the onset of measles presents an entirely different clinical picture from that seen following this disease.

Figure 6 shows the incidence of measles in New

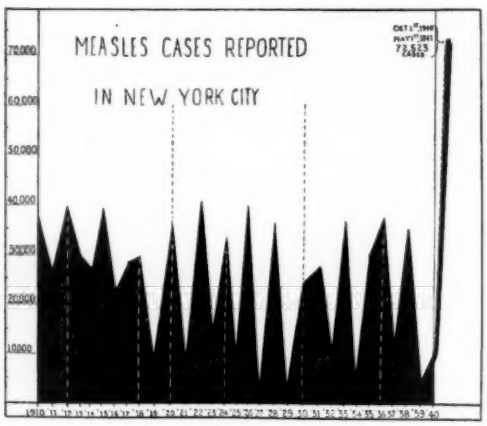

Figure 6.

York City from 1910 to 1940. This disease runs definitely in 2-3 year cycles. Our all time high in mastoidectomies at Manhattan occurred in 1924. This was a rising year for measles, but there are other higher points. And when we reached our low in acute ears in 1940, look what happened to the measles from October, 1940, to October, 1941, an all time high of 72,523 cases. Obviously, we can not blame the incidence of measles for our trend in mastoidectomies.

The incidence of acute purulent otitis media in cases of scarlet fever may vary greatly. The younger the scarlet fever patient the more apt he is to have ear complications. Otitis appearing at the onset of this disease is more dangerous than that occurring during the convalescent period. Mesrin[12] reported 4,660 cases of scarlet fever in which 905, or 19 per cent, presented purulent otitis media; of these, 79 required mastoidectomies, or less than 2 per cent.

Figure 7 represents the incidence of scarlet fever in New York City from 1920 to 1940. Here we see a fairly steady incidence of this disease with various peak years in 1921-1927-1935 and 1940. Again, we find that our rise and fall of mastoidectomies does

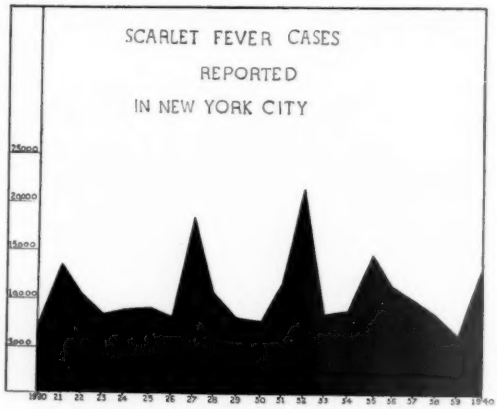

Figure 7.

not follow too closely the incidence of this disease.

Otitis complicating influenza presents a typical clinical entity. The fluid within the middle ear and mastoid cavity is hemorrhagic in character and only at the last is it frankly purulent. Statistics vary as to the severity of this type of lesion. However, early recognition and prompt intervention are essential. It is interesting to note that Roussel and Deyme[16] recommend injections of 10 cc. of the patient's own blood as a preventive measure in epidemics among soldiers.

In Figure 8 we have an influenza graph from

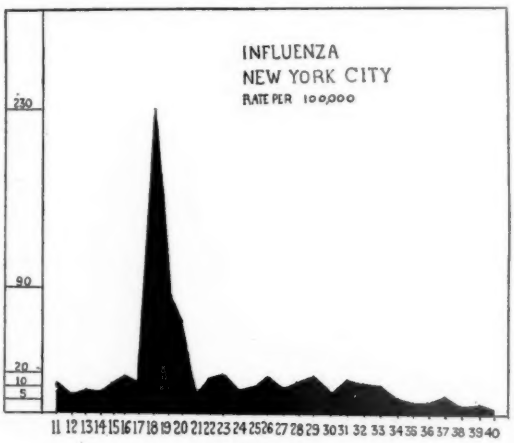

Figure 8.

1911 through 1940. This graph has been taken from the death rate rather than the incidence of this disease. The incidence of this disease, although a reportable disease, is quite inaccurate. The peak year of influenza in 1918 does not seem to have

caused any marked change in the number of acute ears. Notice, however, that following this appalling epidemic was the high water mark in mastoidectomies. What bearing does this have on the trend?

In Figure 9 you see the graph of pneumonia,

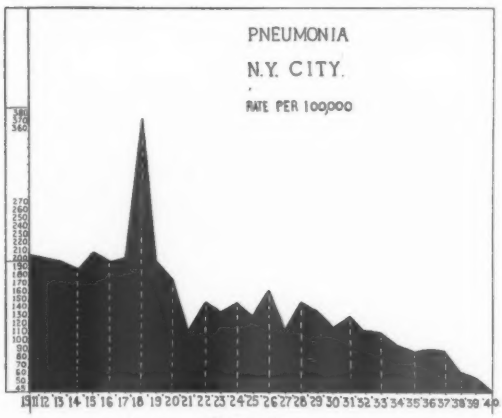

Figure 9.

taken from the death rate. This follows closely the influenza graph with the peak year again occurring in 1918. Pneumonia may in a way represent a composite of other graphs since it is so often a complication of upper respiratory diseases.

Influenza and pneumonia played havoc in 1918. Although they have subsided considerably in the past twenty years, we still find them creeping out from year to year. Influenza may break out in New York and Boston simultaneously, being mild in one city and severe in the other. Like the common cold it has little respect for geography or anything else.

Trask and Berg, from the Department of Health in New Haven, wrote, "Perhaps the severity of some of these diseases is not what it used to be. I feel quite positive that scarlet fever is not the same disease now as it was a few decades ago."

At the Willard Parker Hospital for contagious diseases in New York City, the mortality from 1932-1941 for scarlet fever dropped from 1.5 per cent to .08 per cent in 1940 and with no deaths up to October, 1941; for measles, from 1.7 per cent to .2 per cent; for whooping cough 5.3 per cent to 1.2 per cent, and the total service mortality from 2.7 per cent to .4 per cent.

It is not possible to correlate with any degree of certainty the mastoid or middle ear graph with the incidence of any of these diseases. It is true that during certain years, the connection between middle ear infections and certain upper respiratory conditions is closely related. However, examined over a period of years, we find this is not true.

Then let us find whether the prevalence of these diseases parallels the mastoidectomies. Yes they do—by taking the death rate of all existing contagious and upper respiratory diseases during each month of each year.

Figure 10 shows this relation for the years 1939

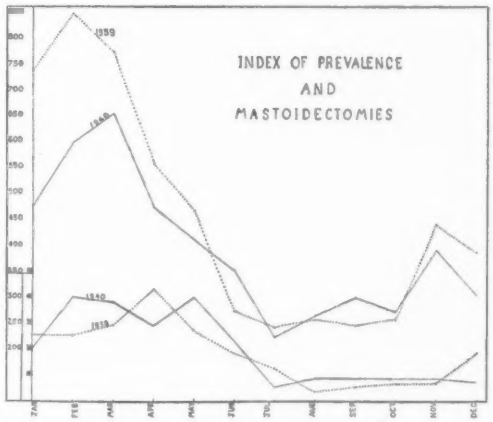

Figure 10.

and 1940 and it may be clearly seen that the two graphs follow. The upper lines represent the death rates and the lower lines the mastoidectomies. Then we can say that our mastoidectomies will follow the prevalence of all upper respiratory infections.

I thought once that with the contagious diseases being ever better controlled that we otolaryngologists might find ourselves mastoidless. Perhaps we have the old common cold to thank for the fact that we can struggle with otitis media a while longer.

In relation to otitis media and mastoiditis, the nasopharynx is *the* important structure. It is the junction or meeting place of the ears, the sinuses and the upper respiratory tract. Too much emphasis cannot be placed on this important area. Cullom[5] shows that there is an incidence of 85-99 per cent involvement of the sinuses present in infections of the middle ear. Campbell[3] found sinusitis present in 100 per cent in 130 patients with broncho- and lobar pneumonia. Fowler, in his study of deafness in children, found associated disease of the sinuses in 91 per cent. Childs' study of 383 cases of scarlet fever found involvement of the sinuses diagnosed by x-ray in 91 per cent.[18] Ashley[2] summarizes this con-

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dition: the predisposing factors are anatomic malformations, allergy, glandular dysfunctions and poor hygiene. The existing causes are acute infections of the upper respiratory tract, acute exanthems, swimming and contact with infected persons. Russell[17] says that allergy may be in some cases merely a hypersensitive state of a mucosa previously damaged by infection. Pickworth[14] refers to the mutation of organisms as described by Dochez and others. These altered bacteria may be reactivated under certain conditions and lead to complications in patients long thought cured. Dean[6] places chief reliance on the removal of obstruction to ventilation and drainage.

The fact that since 1910, over 250,000 adenoidectomies and tonsillectomies have been performed at Manhattan Eye, Ear and Throat Hospital shows the importance attached to these structures. Early attention with removal of obstructions and increasing ventilation may influence or prevent concurrent or subsequent infection of the ear. Crowe places great importance on the recurrence of adenoid tissue in early deafness among children.

The increased interest paid to examinations of school children, the referring of these children for treatment of sinuses and upper respiratory conditions, tonsil and adenoid operations, and improvement in their general condition, has undoubtedly helped to prevent or relieve middle ear infections.

We know that the majority of cases of otitis media and mastoiditis occur in the younger age group. Figure 11 shows our aging population[20], this being

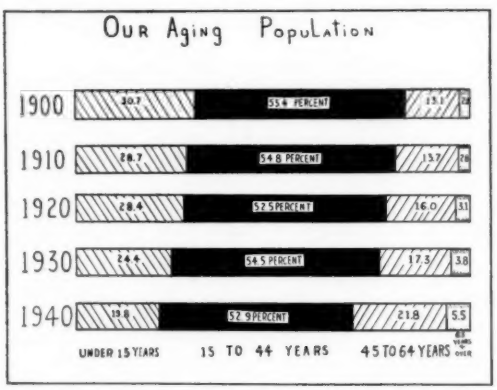

Figure 11.

a fair analysis of the entire country. We find that there has been a gradual decrease in individuals under 15 years of age, from 30.7 per cent in 1900 to 19.8 per cent in 1940. In the age group from 15-44 years there was a slight drop from 53.4 per cent to 52.9 per cent. However, in the age group between 45 and 64 years, we find an increase from 13.1 per cent to 21.8 per cent and an increase in the age group of 65 and over from 2.8 per cent to 5.5 per cent. Knowing that the majority of middle ear infections occur during the early years of life, then it is easy to see that this fact may aid us in our discussion.

Another factor in the decline of otitis media and mastoiditis is one that I should like to avoid. Please believe me when I say that I do not work for any cereal companies and it's nobody's business what I eat for breakfast, but I do believe in these much-advertised vitamins. I believe that vitamin A is necessary to maintain the nutrition of the nasal, aural and tracheal epithelia and that it may decrease the incidence and duration of colds.[8] Vitamin B deficiency produces a definite nasal syndrome, consisting of a post-nasal discharge and the posterior tips of the middle turbinates are smooth, moist, creamy white and slightly thickened.[4] If our diets could be perfect for each individual, dosing with vitamins would not be necessary. This unfortunately is not the case and in my treatment of the forerunners of mastoiditis, I have seen vitamins do a great deal of good and no harm.

Another and perhaps the greatest aid of all in lowering the incidence of mastoidectomies appeared in 1937—the advent of chemotherapy. Perrin Long points out that about 75 per cent of bacterial infections now respond to chemotherapy, a notable exception being the common cold.

Otitis media may be aborted in its early stages under adequate sulfonamide therapy, but, due to the masking of signs and symptoms, we do not advocate it until a myringotomy has been performed and a culture taken. Early myringotomy is essential.

Law,[11] roentgenologist at Manhattan, has pointed out the definite fact that once absorption or breaking down of bone occurs in the mastoid cells, chemotherapy is of doubtful benefit. Frank pus or necrosis, especially within a bony cavity, must be drained.

"Another point which needs emphasis is the fact that these drugs are insidious in their ability to mask symptoms of bone involvement until dire complications have set in. In fact, roentgenological evidence may be completely lacking in cases of severe mastoiditis, which, when administration of the drug is

stopped, assumes its classic form both clinically and roentgenologically."[21]

Figure 12 illustrates this fact. This was a patient

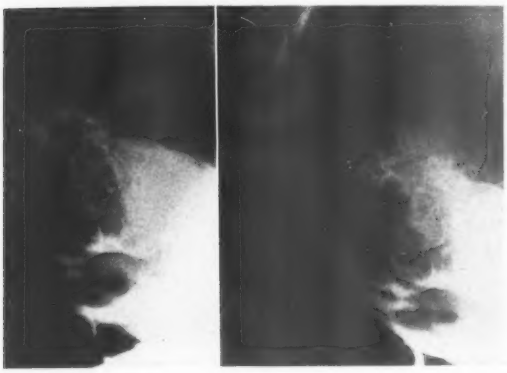

Fig. 12.—Left—X-Ray of mastoid under sulfanilamide. Right—X-Ray of same mastoid four days after discontinuing drug. (Courtesy of Dr. F. M. Law).

23 years of age with acute primary mastoiditis and partial facial paralysis. Under chemotherapy he showed no pain and only slight temperature, but no change in the character of the discharge or facial paralysis. X-ray picture, on left, shows cell outlines with early evidence of bone absorption. Chemotherapy was discontinued and picture on right, taken four days later, shows complete breaking down of mastoid cells. A simple mastoidectomy was performed that day, followed by complete recovery of mastoid condition and facial complication.

Since the advent of chemotherapy the percentage of recoveries of patients with lateral sinus thrombosis at Manhattan has doubled.[10] Meningitis cases have recovered which before would have been fatal.

The general principles to be followed in using chemotherapy in otitis media and mastoiditis are: 1. Correct diagnosis; 2. Isolate the organism; 3. Give sufficient dosage and do not discontinue too quickly; 4. Watch for masking of signs and symptoms or bad effects of the drug; 5. Remember that chemotherapy does not replace surgery. It still seems preferable to me to do a safe simple mastoidectomy early, rather than wait too long on surgery or chemotherapy, and retain a certain degree of loss of hearing in the ear. 6. Each case presents a different problem. Above all do not dwell in a state of false security that all is well until you are sure.

In summarizing, we find that throughout the United States acute simple primary mastoidectomies have dropped to an all time low. This drop started before the advent of chemotherapy and can not be attributed solely to that drug. As a means of therapy the sulfonamides have proved to be a powerful weapon. Their greatest field lies in the complications of middle ear infections, cutting down the mortality to a miraculous degree. The incidence of contagious diseases and upper respiratory infections has apparently not decreased. There has been, however:, a marked decrease in the severity and mortality of these conditions. The acute mastoidectomies follow the prevalance of these diseases and vary from year to year dependent upon the morbidity or virulence of the existing organisms. Heredity, environment, and the shift in age groups must be taken into consideration. The increased attention given to the health of school children, the referring of the children for prompt treatment of sinuses, early care of diseased adenoids and tonsils and an improvement in their general condition have undoubtedly helped to prevent and relieve middle ear infections.

The data that we now possess, the prevention of mortality and ill health and the medical weapons at our disposal make me certain that our health today is better than that of yesterday.

The Record Department of Manhattan Eye, Ear and Throat Hospital and The Department of Vital Statistics of New York City, under Dr. Charles Bolduan, have given valuable assistance in the preparation of this paper.

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REGIONAL ILEITIS
With Report of a Case*

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Regional ileitis is new only in the sense of its discovery. Like appendicitis, it has doubtless always been in existence. Appendicitis was put on the map as a clinical entity by Fitz, of Boston, in 1886, and regional ileitis by Crohn and his associates (Crohn, B. B., Ginzburg, L., and Oppenheimer, G. D.: Regional Ileitis; a Pathologic and Clinical Entity, *J. A. M. A.*, 99:1323, 1932). Cases of what was probably regional ileitis were reported as long ago as 1806 by Combe and Saunders before the Royal College of Physicians of London. It was also described by others, but the first thorough study of the disease with its symptoms, pathology and clinical course was made by Crohn and his associates in 1932. There has been no essential change in the description of the disease since their report.

However, the field of observation has been broadened. Thus it is now known that instead of being confined to the terminal ileum the disease, which is more properly called regional enteritis, may affect any portion of the small bowel up to, and occasionally including, the duodenum and may also involve the large bowel, particularly on the right side in conjunction with the ileum. But it still remains true that in the great majority of cases the terminal ileum is the most frequent site.

Little is known of its etiology. It was at first thought that some specific bacterium of bacillary dysentery, or even the bacillus of tuberculosis, was the etiological factor. This, however, has never been proved and it is now generally accepted that there is no specific bacterial cause for this disease. Whether it is from a virus is a matter of speculation; though it seems probable. While this disease is not caused by the tubercle bacillus, there may be giant cells present though the general structure of the tubercle is lacking. The giant cells resemble foreign body giant cells that are found in ulcerations of the bowel in which particles of fecal matter incite this reaction. The disease is a non-specific granulomatous ulcerative lesion beginning probably in the submucosa and infiltrating the submucosa and the mucosa with granulating and cicatrizing tissue. The mucosa becomes ulcerated, forming craters and gutters, and eventually it seems to atrophy (Crohn).

The disease, as has been mentioned, is usually located in the lower ileum. There may, however, be different regions affected and between them segments of healthy bowel. Crohn, Lewisohn, and others now apply the term "skip lesions" to the affected segments. The portion of healthy bowel between the diseased loops is designated as "skip areas".

The symptoms of regional ileitis in its acute stage are often confused with those of acute appendicitis from which it is difficult to differentiate. Pain, tenderness and usually a mass in the right lower quadrant of the abdomen occur, though muscle

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*Read at a meeting of the Richmond Academy of Medicine, Richmond, Virginia, January 13, 1942.

spasm is not so common as in acute appendicitis. These, with a high leucocyte count, simulate very closely acute appendicitis and frequently operation has been performed with that diagnosis. This stage may be recovered from by conservative or medical treatment, or the disease may go into a subacute or chronic stage with symptoms of diarrhea, possibly blood in the stools, and abdominal pain and discomfort. There may be fever, loss of weight, nausea and vomiting, and cramps.

In the first stage the bowel is swollen and infiltrated. The peritoneum is congested and may have small tubercular-like spots. On palpation it resembles a rubber hose. In the secondary, or chronic or subacute, stage the bowel is quite firm. There may be mild symptoms of obstruction, but, strange to say, there is rarely complete obstruction from this disease. Abcesses may form, but the pus is usually quite innocuous and does not have the foul odor of pus from an appendicular abscess. One very notable feature of the chronic stage is the formation of fistulas. The fistulas may be internal between adjoining loops of bowel, and particularly between the lower ileum and the sigmoid, or it may burrow through the perineum and appear as an anal fistula, or after an operation for appendicitis it may follow the course of the scar and appear as an abdominal fistula. This disease, as other ulcerative diseases of the bowel, usually occurs chiefly in the youth, particularly in the second and third decades.

One of the most important methods of diagnosis is a careful roentgenologic examination. This shows a more or less characteristic type of filling defect and string-like appearance of the affected region of the intestine. When, however, a fistula has formed and there is a history of appendicitis with diarrhea the diagnosis is fairly obvious.

In the early stages conservative treatment will often cure, and if a patient with regional enteritis is operated upon under the mistaken diagnosis of appendicitis and the appendix is not markedly involved, it would probably be better to close the abdomen without even removing the appendix, and try dietary and symptomatic medical treatment for at least a few weeks. The results may be checked not only by the patient's symptoms but by roentgenologic examination. If the patient does not improve, then operation should be performed. In the later stages when the disease is farther advanced, and particularly if there is a fistula, surgical operation is indicated. Formerly, resection was almost invariably performed. This was followed by a rather high mortality rate. A short-circuiting operation is now coming somewhat into favor, but the short-circuit must include not only lateral anastomosis but a division or obstruction of the bowel just distal to the anastomosis. A mere lateral anastomosis avails but little, because it permits much of the fecal matter to go over the diseased portion of the bowel and, consequently, affords no rest to the affected segment. When fistulas have formed, the indication usually is for resection of the bowel.

CASE REPORT

The following case brings out some of the points that have been discussed:

The patient, E. S., white, female, 17 years of age, was admitted to St. Elizabeth's Hospital on September 19, 1941, complaining of abdominal cramps and pain and a fecal fistula. She was well until August, 1939, when she had an attack of abdominal pain with nausea and vomiting. A diagnosis was made of "intestinal infection". In August, 1940, there was a recurrence of the symptoms and an appendectomy was done. The wound drained profusely for three weeks and then to a less extent until June, 1941, when an attempt was made to repair the draining sinus. During this time there had been a small amount of fecal drainage from

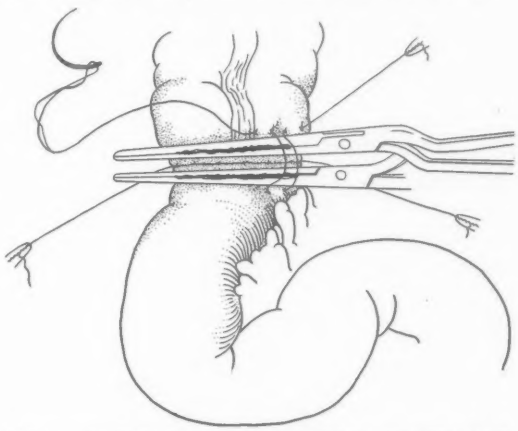

Fig. 1.—An outline of the technic of uniting the bowel after the resection. The clamped stump of the ileum is brought in apposition with the clamped stump of the ascending colon and the under surfaces are fastened together with a continuous basting suture of chromic catgut. Over the anterior surfaces is inserted a basting suture of the same material. Both basting sutures are then held taut while the clamps are removed. The two ends of the basting sutures are tied snugly together and the whole anastomosis is reinforced with a series of interrupted mattress sutures of fine chromic catgut.

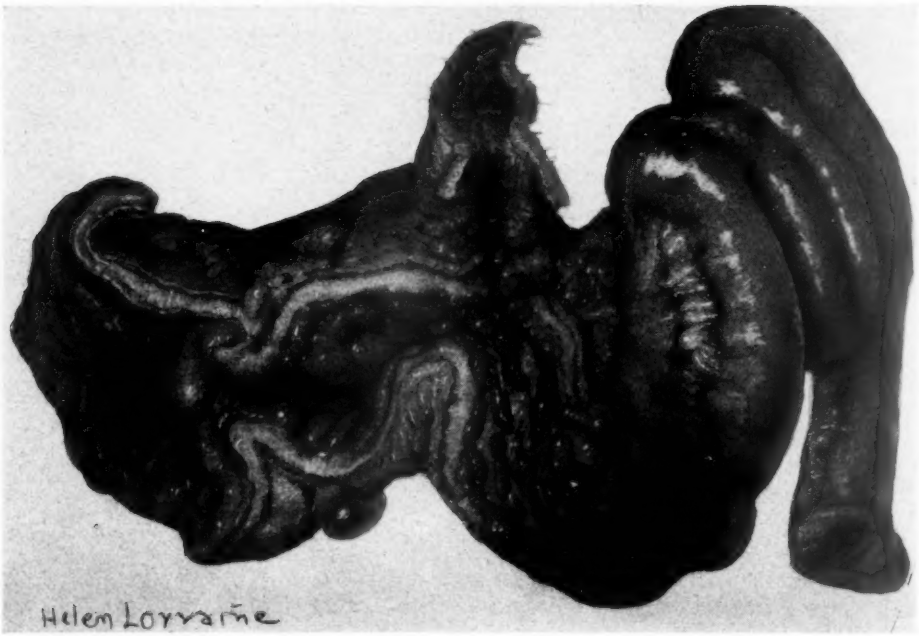

Fig. 2.—A drawing of the specimen that has been opened. In the upper border is shown the fistulous tract with some surrounding skin. The whole specimen was removed in one block. The wall is greatly thickened and the caliber of the bowel is diminished. It is impossible to define accurately the limits of the cecum and ileum. Note the ulcer in the cecum and the ulcerated areas on the proximal side of the fistulous tract.

the sinus. In August, 1941, the fecal drainage increased, and about the first of September the patient was operated upon for "abscess". All of these operations had been done elsewhere. The fecal drainage continued and the patient complained of violent abdominal pain daily since the last operation.

Examination. The patient was poorly nourished and quite thin. She weighed 70 pounds. The abdomen was flat, with increased muscle tone. The liver and spleen could not be palpated. The heart and lungs were normal. In the midline above the pubis was a fecal fistula. The hemoglobin was 71%, r.b.c 3,900,000, temperature 98.6, pulse 108, respirations 28. X-ray examination with barium enema showed that the colon filled normally as far as the cecum. At that point there was an irregularity and changes which suggested a filling defect.

Operation. Operation was performed September 25, 1941. After packing the fistulous opening with a strip of iodoform gauze soaked in iodine solution, an incision was made around it. The peritoneal cavity was entered from above. The adhesions of the bowel to the abdominal wall were separated. The mass of tissue with the fistula was mobilized and the mesentery to the bowel that was to be excised was clamped and divided. The cecum was greatly distorted. There were many enlarged lymph nodes. The ileum well above the lesion and the ascending colon were doubly clamped and divided with the electric cautery. The two stumps were approximated and their under surfaces were united with a continuous basting suture of No. 0 chromic catgut. A similar suture was placed anteriorly and the sutures were drawn snugly while the clamps were removed (Fig. 1). The ends of the sutures were tied together and a series of interrupted mattress sutures of fine chromic catgut was placed around the anastomosis anteriorly and posteriorly. The long ends of the mattress sutures were passed through omentum and tied. Sulfanilamide was placed on the raw surface and in the peritoneal cavity. Through-and-through sutures of zytor were inserted in the abdominal wound, but were not tied. The peritoneum and posterior sheath of the rectus muscle with some of the adjacent tissues were brought together with a continuous suture of No. 0 chromic catgut. This was reinforced with a few interrupted sutures of the same material. No effort was made to close the skin. The wound was

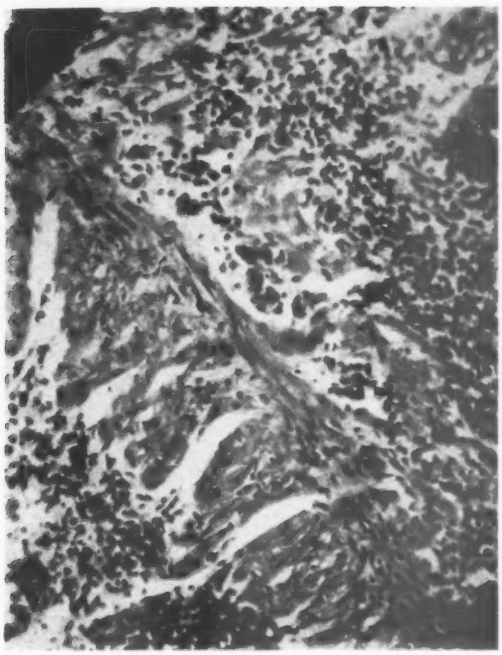

Fig. 3.—Photomicrograph of tissue from the interior surface of the specimen, showing some of the muscular coat and extensive leucocytic infiltration of the intestinal wall (x250).

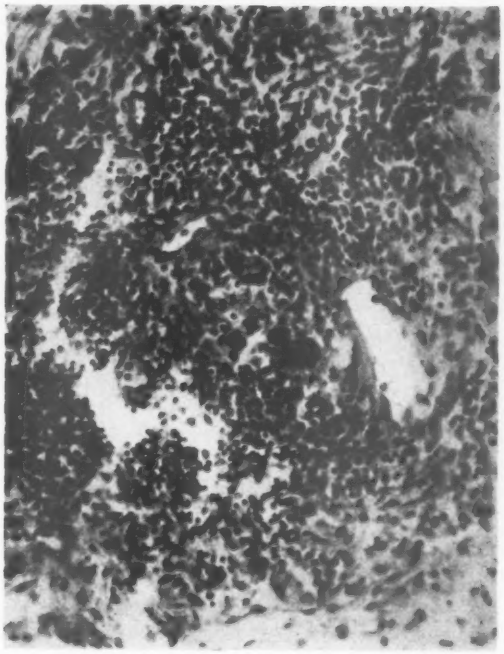

Fig. 4.—Photomicrograph of a deeper area of the specimen, showing leucocytic infiltration and giant cells (x250).

dusted with sulfanilamide and packed with vaseline gauze. She was transfused.

The Specimen. The specimen consists of the terminal ileum, cecum and some of the ascending colon. The portion of the ileum and cecum measures 55 cm. The cecum and ascending colon measure 12 cm. in length. In the attached mesentery are many enlarged lymph nodes. On section of one of them it is soft but not necrotic. It does not appear to be malignant or tuberculous. A block is taken of one of the lmyph nodes for permanent section. On the anterior surface of the specimen is a fistulous tract that has been dissected out intact, together with a small amount of surrounding skin. The terminal ileum and cecum formed a common tube. The whole wall is greatly thickened and the mucosa is converted into a granular ulcerated surface with some edematous patches of mucosa. Extending above the fistulous tract there is a superficial ulcerated area of the mucosa, most conspicuous on the mesenteric border of the ileum, which is an extension of the disease (Fig. 2). Above this the ileum appears to be normal, but from this point down to and including the cecum the disease seems to increase in intensity and inflammatory reaction infiltrates all of the bowel wall. At the distal end of the specimen is a segment of the colon about 5 cm. in length which appears to be normal. Microscopic examination shows intense leucocytic infiltration and granulation tissue. There is no evidence of malignancy (Figs. 3 and 4).

Subsequent Course. The patient suffered for the first ten days or two weeks from abdominal cramps. These gradually disappeared. She was given a second transfusion of blood October 2, 1941. The through-and-through zytor sutures were tied on October 6, 1941. The patient was discharged from the hospital on October 29, 1941. The wound had closed and she was feeling well.

A letter received on December 31, 1941, stated that she was in excellent condition.

CARCINOMA OF THE THYROID*

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On reviewing cases diagnosed as carcinoma of the thyroid at the University of Virginia Hospital between 1924 and 1941 the traditional difficulty in both pathological and clinical recognition was early noted. The present paper emphasizes this problem and presents data on twelve proven cases. A brief review of recent literature indicates the confusion of opinion still existing.

I. REVIEW OF THE LITERATURE

Pathological Diagnosis, Classification and Distribution. Wilson,[53] in 1921, reviewed the subject and listed twenty-three "principal tumor types". Graham[14] later called attention to the large percentage of sarcomas of the thyroid reported in the earlier literature and pointed out that this was undoubtedly due to mistakes in diagnosis. He also pointed out that one may find in a benign thyroid tumor a cell arrangement and development which when seen in other organs have been unquestionable evidences of malignancy, and, conversely, that metastasis and death may occur from a tumor whose microscopic appearance resembles normal thyroid. The failure to recognize this led to the contradictory terms "benign metastasizing goiter", "benign metastasis from a malignant primary tumor" and "malignant metastasis from a benign primary tumor".

Graham[12] cited as criteria for the diagnosis of thyroid malignancy "local invasion, recurrence (of the original tumor) after incomplete excision, metastasis, death of the patient due to the invasive character of the tumor", and added, in 1924, invasion of the blood vessels by the tumor. He pointed out that the latter is always found in certain types of malignancy and is not hard to discover. These criteria have been used in the review and reclassification of our series of tumors.

There have been many classifications of malignancies of the thyroid. The one proposed by Pemberton[36] is simple and adequate and affords a satisfactory pathological and clinical basis for discussion.

1. Papillary adenocarcinoma
2. Adenocarcinoma in fetal adenoma (malignant adenoma)
3. Diffuse adenocarcinoma
4. Epithelioma
5. Sarcoma.

Other authors include lymphosarcoma; Broders and Warren, however, think it is never primary in the thyroid.

The reported incidence of sarcoma of the thyroid has decreased with increasing knowledge of the disease, and Ewing[10] states that "the occurrence of true sarcoma (of the thyroid) in man still requires demonstration". Rienhoff,[42] on the other hand, lists five types of sarcoma arising in the thyroid. Sarcoma and lymphosarcoma are unquestionably very rare although a few apparently well authenticated cases have been reported.

The distribution according to types reported by various authors is shown in Table I and presents no significant variance. It should be noted that papillary adenocarcinoma and malignant adenoma are the least malignant types of thyroid cancer and that 70 to 80 per cent of all malignant tumors are of these two types.

From Table II it can be seen that there is little difference in the reported percentage of cases falling into the various grades of malignancy when grouped according to the Broders' grading of malignant tu-

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Read at the annual meeting of the Medical Society of Virginia at Virginia Beach, October 6-8, 1941.

TABLE I—DISTRIBUTION OF THYROID TUMORS ACCORDING TO TYPE

	Papillary Adenocarcinoma	Malignant Adenoma	Diffuse Adenocarcinoma	Epithelioma	Other Types
Pemberton[36] 517 cases	30%	38%	30.4%	1.6%	
Portman[39] 200 cases	16.5%	54.8%	14.3%		14.4%
Watson and Pool[51] 167 cases	34%	42%[1]	18%[2]		6%

[1]This figure includes the "small alveolar large cell adenocarcinomas" and "unclassified adenocarcinomas".
[2]This figure includes the "spindle and giant cell carcinoma" and the "small round cell carcinoma".

TABLE II—DISTRIBUTION OF THYROID TUMORS ACCORDING TO GRADES OF MALIGNANCY

	Grade I	Grade II	Grade III	Grade IV
Pemberton[88]	29.6%	38.5%	14.5%	17.3%
Watson and Pool[51]	36.7%	30.0%	27.3%	6.0%

mors. By this method of classifying approximately 70 per cent also fall in the least malignant grades.

It would seem therefore that the prognosis in thyroid cancer should be favorable. This unfortunately is not true because many of the cases when seen are too far advanced for complete surgical excision and because nearly all thyroid tumors are radio-resistant.

Clinical Diagnosis. The fact that at least 50 per cent of malignant thyroid tumors are diagnosed by the pathologist without definite clinical evidence of malignancy indicates how difficult and unsatisfactory is the clinical diagnosis.

In the early stages there are no positive clinical diagnostic signs or symptoms. There is nearly always a tumor which has been present for some time although this may not be palpable if it is small and lies in the posterior part of the gland.

Thyroid malignancy is suspected because of a somewhat fixed, hard tumor of the thyroid; because of recent growth either slow or rapid, and because of secondary evidences of pressure such as difficulty in swallowing or breathing, and hoarseness. Metastasis to the regional nodes or distant metastasis may be the first clinical indication of malignancy.

When the diagnosis can be made clinically the prognosis is usually poor.

Carcinoma of the thyroid has to be differentiated from nodular goiter, acute and chronic thyroiditis, Hashimoto's disease and hemorrhage into a benign adenoma. This may be difficult and if there is any possibility of malignancy biopsy should be performed.

Incidence of Carcinoma of the Thyroid. It is difficult to arrive at an accurate estimate of the incidence of carcinoma of the thyroid. Schreiner and Murphy[44] report that in goitrous areas malignancies of the thyroid are five to eight times as frequent as in non-goitrous areas. This is not surprising when one considers that from 80 per cent to 98.8 per cent* of all thyroid carcinomas arise from a pre-existing nodule and that in goitrous areas the incidence of nodular goiter is very high.

Table III shows the incidence of thyroid malignancy to vary from 1 per cent to 8.8 per cent of cases of thyroid disease coming to surgery. The incidence is higher in patients with nodular goiter.

TABLE III—INCIDENCE OF THYROID MALIGNANCY

	Cases of Malignancy	Percentage of Thyroid Operations	Percentage of Nodular Goitre
Pemberton[87, 88]	774	2%	4.9%
Smith, Pool and Alcott[49]	54	2.5%	4.7%
Clute[3]	187	2.86%	
Hull[20]	9	1.7%	2% to 6%
Graham[12]	108	1% to 2%	
Kocher (cited by Haas[15])		6% to 8.8%	
Haas[15]		0.7%	
Schlessinger *et al*[43]			4.5%[1]

[1]Of 112 nodular glands examined at autopsy.

Sex. While all thyroid disease is five to seven times as frequent in women as in men, carcinoma of the thyroid occurs in a ratio of only 2.24 : 1, as is shown in Table IV.

TABLE IV—SEX INCIDENCE OF CARCINOMA OF THE THYROID

	Females	Males	Ratio
Pemberton[88]	492	282	1.74:1
Clute[3]	198	28	7:1
Watson and Pool[51]	117	50	2:1
Total	807	360	2.24:1

Age. The age incidence corresponds roughly to that of carcinoma situated elsewhere, that is, most of the cases occur in the fifth, sixth and seventh decades, although a number of cases have been reported in the first and second decades.[47, 22] In children, because of the greater risk of malignancy when nodules are present, Kennedy[22] advises strongly for their early removal.

HYPERTHYROIDISM

Table V shows the incidence of carcinoma of the thyroid and hyperthyroidism reported by several authors. Cases have been reported in which the primary tumor and the metastatic tumor have proved to have secretory power (Eiselberg, cited by Clute and Warren,[2] and Mills[33]). Suppression of thyroid activity with resultant myxedema has also been re-

*It is estimated by various authors[46, 8, 12, 21] that from 80 per cent to 98.8 per cent of all thyroid carcinomas arise in pre-existing nodular goiters and that from 2 per cent to 6 per cent of nodular goiters coming to operation are malignant.

TABLE V—INCIDENCE OF CARCINOMA OF THE THYROID AND HYPERTHYROIDISM

	Cases of Malignancy	Cases of Malignancy and Hyperthyroidism	Incidence
Pemberton[38]	774	10	1.3%
Coller[31]	99	1	1.0%
Clute and Warren[2]	226	4	1.8%
Total	1,099	15	1.4%

ported, and removal of the malignant tumor was followed by normal function of the remaining thyroid gland.

Carcinoma Arising in Aberrant Thyroid Tissue. There is a wide divergence of opinion as to the incidence of carcinoma in aberrant thyroid tissue. Moritz and Bayless[34] found that 2.8 per cent of carcinomas of the thyroid reported in the literature arose in aberrant thyroid tissue and that 28 per cent of the cases of aberrant thyroid tissue reported were malignant.

Hare and Swinton[16] and others from the Lahey Clinic[23, 24] state that 60 per cent of lateral aberrant thyroid tissue is or becomes malignant.

Broders (cited by Foss[11]), on the other hand, questions the origin of malignancy in aberrant thyroid tissue. Pemberton[36, 38] agrees with Broders and thinks that carcinomas found in these locations are deposits of malignant cells from a primary tumor of the thyroid gland.†

Crile[5, 6] is of the opinion that "tumors arising in lateral thyroid tissue are essentially benign" and are not metastases to cervical lymph nodes from malignant tumors of the thyroid gland. He thinks that their complete surgical removal will cure the patient.

To prove the origin of carcinoma in lateral aberrant thyroid tissue one must rule out the presence of a tumor in the thyroid gland and this may be impossible to do except at autopsy.

Treatment. The best results have been obtained by radical surgical excision of the tumor as advocated by Crile and Crile[4] and others,[23, 51] followed by large doses of x-ray or radium to the neck.

If only incomplete excision is possible, heavy doses of x-ray post-operatively have been followed by an increased period of comfort and length of life. When even partial excision is impossible, a biopsy should be done and the patient then given large doses of x-ray. Some patients will improve greatly and the tumor may regress sufficiently to allow excision later.[23]

When thyroid carcinoma is found outside the gland it is important to search for a primary lesion in the lobe of the gland on that side of the neck and to do a wide surgical excision of the cervical lymph nodes in addition to the removal of any tumors found in the thyroid gland. If no tumor is palpable in the gland it would seem wise to remove the entire lobe on the affected side for microscopic examination because it is well known that the primary tumor may escape detection on gross examination.

Probably the most important part of the treatment is the prophylactic removal of all thyroid nodules. The reasons for this are well summarized by Pemberton,[36] as follows:

"1. Carcinoma develops 80 per cent to 90 per cent of the time in pre-existing adenoma; therefore, the retention of adenoma entails a certain risk of carcinoma, though the extent of this risk cannot be accurately estimated.
"2. There is a low operative risk.
"3. These tumors rarely recur.
"4. One cannot say that any tumor is benign (50 per cent of the carcinomas are found in clinically benign tumors).
"5. The patient may develop hyperthyroidism or the increase in size of the tumor may demand its removal."

II. SUMMARY OF CASES SEEN AT THE UNIVERSITY OF VIRGINIA HOSPITAL

In reviewing the records of the University of Virginia Hospital, thirty-one cases were found in which the diagnosis of carcinoma of the thyroid was made or suspected either clinically or pathologically. Slides were available for study on twenty-six of these cases. Preceding a review of the records and preceding the follow-up, the slides were reviewed and on this basis alone the present histological diagnosis was made. The records were then reviewed and the

†"Malignancy of lateral aberrant thyroid tumors is always limited to a certain type, that is, papilliferous adenocarcinoma which . . . has a predilection for spreading by way of lymphatic structure or by direct implantation." And, "The frequency with which tumors are found to be associated with a similar type of malignancy of the thyroid gland proper and the fact that they are always in the same side of the neck as the malignancy of the thyroid are two further evidences in favor of their metastatic origin"[38].

TABLE VI—CASES SEEN AT THE UNIVERSITY OF VIRGINIA HOSPITAL

Group	No.	Original Diagnosis		Present Diagnosis
		Path.	Clin.	
I	12	Malignant 12	Malignant 10 Benign 2	Malignant 12
II	11	Malignant 11	Benign 11	Benign 11
III	5	None	Malignant 5	Malignant 3 Benign 2
IV	3	Benign 3	Malignant 3	Benign 3

patients were followed up as completely as possible.

From the above study only twelve of the twenty-six cases are called carcinoma and fourteen are considered benign.

The follow-up of the whole series suggests the accuracy of the recent pathological review. The two groups will be presented separately.

Cases of Proven Carcinoma of the Thyroid, Group I, Table VI.

Of the twelve cases of cancer of the thyroid:

Five were papillary adenocarcinoma
Three were malignant adenoma
Four were diffuse adenocarcinoma

There were no cases of squamous carcinoma and none suggesting sarcoma or lymphosarcoma.

During the period 1924 to 1941 in which these cases were seen, 521 cases were operated upon for thyroid disease, giving an incidence of carcinoma of 2.3 per cent. There were three other cases in which the diagnosis may be assumed but in which no biopsy was done. If these are included the incidence becomes 2.9 per cent. There were nine females and three males. The ages of these patients varied from seventeen to seventy-five years. Three of the fifteen cases of carcinoma including three without biopsy were in colored patients, an incidence of 20 per cent. About 16 per cent of the patients admitted to the hospital during this time were colored. These figures for incidence in general agree with the figures developed in the larger series already discussed.

In three cases the diagnosis of carcinoma of lateral aberrant thyroid tissue was made. In two of these carcinoma was also found in the thyroid gland so that the so-called "aberrant" thyroid tissue is now thought to represent metastasis from a tumor in the thyroid. Both died of the disease. In the third case there is no record of the thyroid having been explored. This patient is well one year and four months later and shows no evidence of recurrence.

The clinical characteristics presented by the disease were as variable as the literature would indicate. The nodule in the thyroid had been noted for periods varying from one month to twenty years. In one case a metastatic nodule in the groin was noted three months before the appearance of the nodule in the thyroid.

Two cases had clinical hyperthyroidism and were operated on for this. Malignancy was not suspected clinically. There was an elevated basal metabolic rate in two others (plus 79 per cent and plus 60 per cent), which was probably due to respiratory obstruction. In four other cases where the basal metabolic rate was recorded it varied from minus 20 per cent to plus 1 per cent.

The treatment of these cases was equally divided into four groups. Three were treated with surgical excision alone; three had surgical excision followed by x-ray; three had biopsy followed by x-ray and three had biopsy only. Of those who had biopsy only, two had distant metastases when first seen and the third refused further treatment. The amount of x-radiation varied from 250(R) to 3000(R).

In no case was so radical an operation performed as is now advocated by Crile and Crile[4] and others[16, 51] and the amount of radiation has been less than is now recommended (Lahey, 6000(R), Portman, 2400(R), to each field, Memorial Hospital group 3000(R) to the affected side).

The results of treatment have been almost entirely unfavorable. Eight of the twelve cases are dead. Seven died of the disease and one of cardiac disease, the longest duration of life having been five years. One patient is alive and well one year

and four months later. The only patient who has survived more than five years is one whose tumor was of the most benign type and who received 1200(R) of x-radiation to each side of the neck post-operatively. Two were not traced.

Cases Originally Diagnosed Malignant Now Diagnosed Benign, Group II, Table VI.

In eleven cases the original pathological diagnosis of a malignant lesion was changed to benign by recent study. Only two of these cases were first seen within the last ten years, a fact which reflects our increased knowledge of the histological criteria in the diagnosis of thyroid cancer. All of these cases were treated by surgery.

Nine of these cases are alive and well from one to twenty-seven years (only one less than five years) after the original diagnosis was made although three have evidence of thyroid enlargement.

One died probably of carcinoma of the larynx six years after our diagnosis of carcinoma of the thyroid.‡ One was not traced. It is obvious that these results confirm the accuracy of the recent pathological study.

Clinical Diagnosis of Malignancy Without Biopsy, Group III.

In five cases of clinical diagnosis of cancer was made without biopsy. Three of these are now thought to have died of this disease, one is alive without evidence of cancer and the fifth died of tuberculosis. This apparent error in the clinical diagnosis in two of five cases emphasizes the importance of biopsy.

Discrepancies Between Clinical and Pathological Diagnoses.

The data in Table VI present the surprising fact that the clinical opinions expressed in the records differ in sixteen cases from the pathological diagnosis. A few of these differences may be due to carelessness of recording but the fact that any such differences occur is arresting and illustrates the confusion and uncertainty that underlies the diagnosis of carcinoma of the thyroid. In eleven instances, the clinicians were correct in the diagnosis of a lesion now considered benign when the pathologist diagnosed malignancy. (Group II, Table VI). The clinicians were wrong in five instances. In two cases now considered malignant (Group I, Table VI) the clinical diagnosis of a benign lesion was made in opposition to the pathologist's. In three instances the clinical diagnosis was malignant whereas the original and final pathological diagnosis is benign (Group IV, Table VI).† Most of these differences occurred during the early years covered by this study. During recent years as the accuracy of the pathological diagnosis has increased the clinicians are depending more and more completely on the pathologist's opinion.

‡This patient died at another hospital six years after the original diagnosis of carcinoma of the thyroid was made by us. She was treated in the meantime for carcinoma of the cervix and for carcinoma of the larynx. Since there is no evidence indicating carcinoma of the thyroid, she is thought to have died of carcinoma of the larynx.

SUMMARY AND CONCLUSIONS

In a review of the recent literature on carcinoma of the thyroid the following points are outstanding:

1. The clinical and pathological diagnosis of carcinoma of the thyroid is difficult.
2. Graham has established certain criteria for the accurate pathological diagnosis of carcinoma of the thyroid.
3. Radical surgical excision followed by intensive x-ray therapy has given the best results.
4. Aberrant thyroid carcinoma is probably always secondary to a primary thyroid tumor.
5. All nodules of the thyroid are potentially malignant and should be removed.

Twelve cases seen at the University of Virginia Hospital were found to be in agreement with the experience of others in this disease.

I am indebted to Dr. James R. Cash for his help in reviewing the slides and manuscript and to Dr. Edwin P. Lehman for his help and criticism.

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†These three cases are alive and well at three, four, and eighteen years later.

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A CASE REPORT OF CENTRAL NERVOUS SYSTEM SYMPTOMS ASSOCIATED WITH MEASLES IN AN ADULT*

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The following case was the last in a series of three similar cases seen this year. All three cases were seen during the local epidemic outbreak of measles in the spring and early summer of 1941. A feature of this epidemic was its wide age range of attack.

The case I wish to report is that of a white married male, 26 years of age, occupation waterman, referred by Doctor E. W. P. Downing. My first knowledge of the case was on the morning of July 22, 1941, when Doctor Downing discussed with me by telephone the condition of a patient whom he was treating at home for measles. The patient had lapsed into semi-consciousness and Doctor Downing wondered whether it was possible for him to have taken more phenobarbital than his instructions or the history could account for. A few hours later the hospital was requested to send the ambulance for the patient. I found out later that the hospital desk clerk understood the person calling to say it might be a case of diabetic coma but that Doctor Downing had called me about the case before. I go into this detail because I feel it shows the puzzling condition of the patient as clearly as does the history which follows.

The history, as taken from his wife and mother, revealed that he had developed measles ten days before. He had gotten along satisfactorily and had gone to a picture show in the evening four days before being admitted to the hospital. But three days before admission he had complained of feeling miserable and for approximately forty-eight hours before admission he had been sleepy, irrational, very sensitive when touched and unable to eat. He had had no medicine during the previous forty-eight hours and had only taken a grain and a half of phenobarbital once several nights before in order to sleep.

On examination he was found to be well-developed. There was a mottling flush, particularly over the face. This was not cyanotic but looked as though it might be vaso-motor in origin. He was especially hypersensitive and irrational, required bed rails, and it took four people to hold him when blood was taken from his arm. The nose and throat were moderately congested. Mouth condition indicated the lack of care of the past two days. Blood pressure on admission was 124/90, axillary temperature 98.2, pulse 108 and respiration 24. Rectal examination was impossible. The patient was totally irrational, wild-eyed when worked with and apparently in growing coma when not bothered or worked with.

Based on my impressions from the other two cases, the following orders were written: Neoprontosil, grains 15, by mouth every four hours con-

*Read before the Seaboard Medical Association of Virginia and North Carolina, at Virginia Beach, December 3, 1941.

tinuously if he was able to take it, but, if not, he was to be given 20 cc. of a 2.5 per cent solution of neoprontosil subcutaneously or intramuscularly. The nurse on the case was pleasant and insistent and convinced that the oral medication could be given but, after several failures, was forced to start with subcutaneous medication. This first dose was given at 4:15 P. M., the patient having been admitted at 3 P. M. By this time the blood taken on admission had been reported to show hemoglobin-Sahli 100 per cent, R.B.C. 4,750,000, W.B.C. 16,-400, P. 85 per cent, L. 15 per cent, smear normal, negative for malaria, coagulation time 4 minutes. A voided specimen of urine was not available and I decided not to attempt catheterization as Doctor Downing had examined a specimen several days before and found it negative.

Around 9 P. M., approximately six hours after admission, he seemed more rational. He complained of soreness in the chest and abdomen and coughed some. He was given codein, grains one, hypodermically. With encouragement he was able to take fluids by mouth through a rubber-tipped tube. At midnight, approximately nine hours after admission, he slowly took and retained 15 grains of neoprontosil by mouth. He had received only 40 cc. of the 2.5 per cent solution by subcutaneous injection before oral medication could be substituted.

The first specimen of urine was obtained eight hours after admission. It was voided, twenty-eight ounces, red due to the neoprontosil, hazy, acid, specific gravity 1.023, negative for albumin, sugar and diacetic acid, and the microscopic showed 2 to 4 pus per h.p.f. and an occasional r.b.c.

When seen at the next morning rounds, approximately 18 hours after admission, he was definitely improved, there was no skin discoloration but some cough and some general soreness. His blood pressure was 110/60.

His temperature reached a high of 100 degrees axillary the second day of admission and remained thereafter between 97 and 98 degrees axillary. The pulse varied between 60 and 80 except for the pulse of 108 on admission. The respiration varied between 16 and 20 except for the respiration of 24 when admitted.

Two days after admission, on July 24, 1941, his laboratory report was: hemoglobin 96 per cent, R.B.C. 4,700,000, W.B.C. 14,600, P. 81 per cent, L. 19 per cent. Blood agglutinations for typhoid fever, Para A and B, Malta fever, tularemia and typhus fever were negative. Blood Kahn was negative. Urinalysis: red, hazy, acid, specific gravity 1.015, albumin, sugar and diacetic acid negative. Microscopic showed 2 to 6 pus cells and 1 to 2 r.b.c. per h.p.f.

The rest of the patient's six-day hospital stay was uneventful. His whole management consisted of restraint as needed on admission, neoprontosil, 40 cc. of 2.5 per cent solution and 215 grains by mouth, codein, grains 1, hypodermically, a total of 4 grains of soluble phenobarbital hypodermically for restlessness, nose and mouth care, fluids by mouth as able to take, which could be given in small amounts approximately four hours after admission and by the second night summary reached 130 ounces per 24 hours, and soft diet beginning on the second night. The management of this case was based on impression and not on scientific data, and, as stated, on past experience with two other cases.

His blood culture, which was taken on admission before any medication was administered, was reported negative on August 2, 1941, eleven days after being taken.

When discharged from the hospital, he was advised to stay in bed at his home until seen by Doctor Downing. In following up the case, I found that he stayed around the house for a week, was out and around a week and then back to work, as directed by Doctor Downing, and, when I happened to see him several weeks later, he was perfectly well, was working daily and had no complaint.

No attempt will be made to report the other two similar cases, but a few points of interest will be given. The first case in this group was a white female, age 12, who was unconscious approximately 28 hours before admission to the hospital, this period benign characterized by absolute quietness when left alone and wild hyperactivity when worked with. This patient under the same management was unable to take fluids by mouth or show any rational movements until 33 hours after admission. This time interval is important to me as it offsets the seemingly too prompt improvement of the case reported in detail, but it is logical when one compares the conditions of the two patients on admission.

XUM

The second similar case was a white female 14 years of age, and in this case the outstanding difference was the marked peripheral circulatory failure which was present from the first and for which large doses of strychnine were given hypodermically.

The dose of neoprontosil solution 2.5 per cent used in all three cases was calculated on 1 cc. per pound body weight up to a maximum of 120 pounds weight.

In each of these cases it was felt that the condition of the patient was critical. None of these cases seemed to me to fit into the picture of a transient toxemia which, given time and nursing care, would get along satisfactorily. The risk of sulfonamide therapy was carefully weighed against the dangerous state of the patient and I felt its use was justified.

No attempt will be made to even theorize as to the possible action of the neoprontosil. If one contends that measles is due to a virus and this was a virus complication, any effect of sulfonamides on this particular virus would have to be established. If it is assumed that measles is a manifestation of a streptococcus infection, proof cannot be produced to support this contention either.

Finally, let me say that this case is reported because it interested me, and I hope it has you, but no effort is made to make this one small stone or all three small stones into any mountain of experience or evidence.

GASTRIC HYPOACIDITY*

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It seems feasible in this paper to designate the term "hypoacidity" to a finding of less than twenty five degrees of free hydrochloric acid after histamine stimulation. This term is used in contradistinction to "hyperacidity"; but due to the gravity of most cases that do not secrete any acid after histamine injection, it advisable to further classify.

The term "hypochlorhydria" is used to denote a decrease of free hydrochloric acid below twenty-five degrees after histamine injection and occurs in some neuroses, chronic gastritis, syphilis, early carcinoma of the stomach, sprue, secondary iron deficiency anemias, hepatic cirrhosis, pellagra, chronic pancreatitis, types of diarrheas, and in many varied conditions with general systemic depression, such as the menopause and hypotension.[1] Of one hundred cases of hyperthyroidism, S. A. Wilkinson found that thirty-six per cent had achlorhydria and the average acidity of all cases was reduced to slightly more than half the normal. After thyroidectomy, only ten and five-tenths per cent showed achlorhydria. The theory is offered that the depression of gastric acidity is a phenomenon of extreme symphathetic over-stimulation.[2]

The complete and persistent absence of free hydrochloric acid after histamine stimulation is termed "achlorhydria", or "achylia gastrica", and occurs in most cases of gastric cancer, far advanced gastritis, pellagra, some cases of hysteria, pulmonary tuberculosis, and is a constant and important symptom of primary pernicious anemia occurring often before the blood picture is diagnostic or during remissions when a diagnosis is difficult.

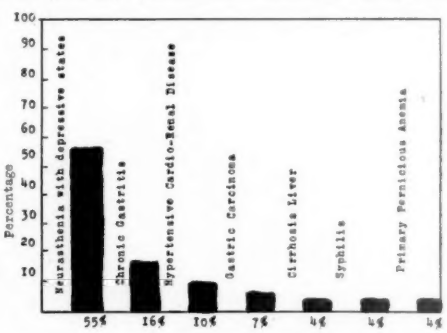

Fig. I.—The etiology of 62 cases of gastric hypoacidity. Neurasthenia with depression accounts for more than one-half of the cases. It is interesting to note that there are only two cases of complete achlorhydria present in the neurasthenics.

It has been learned from fractional analysis after histamine stimulation that a wide range of secretory variability may exist in the stomach contents of presumably healthy individuals. The finding of hypochlorhydria in persons suffering from few, if any, gastric symptoms, but who are of a neuras-

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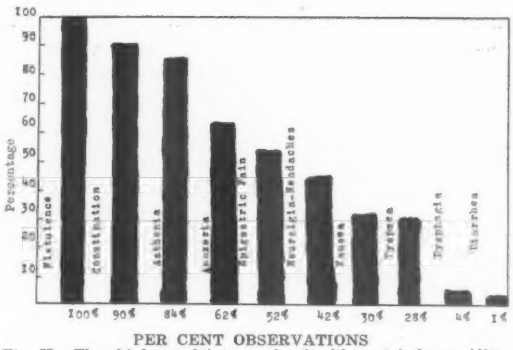

Fig. II.—The chief complaint associated with gastric hypoacidity in the study of 62 cases. Reveals how confusing the symptomatology may be in a patient's history.

thenic tendency, focuses the light upon hypochlorhydria as an extreme form of functional secretory disturbance.

The supposition that neurasthenia is character-

AGES	NUMBER OF CASES	PERCENTAGES
20-30	4	6.5
31-40	10	16.0
41-50	27	43.7
51-60	19	30.6
61-70	2	3.2

Fig. III.—The greatest number of cases fall in the fifth and sixth decades; thus the majority of cases occur in mid life. The youngest case was 20 years—the oldest was 67 years.

ized by hypoacidity curves is not fully sustained by investigation. In cases of psychoneurosis, dementia praecox, and exhaustive toxic psychoses a high percentage of relatively normal acidity has been found. In psychoses of the depressed, anxious, and retarded types, however, a high percentage of hypochlorhydria or achlorhydria with re-

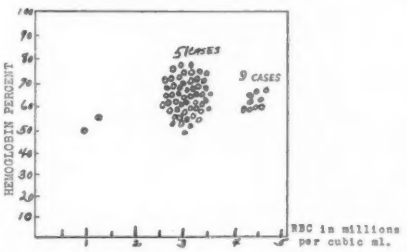

Fig. IV.—In the 62 cases of hypoacidity, every case demonstrated a hemoglobin of 75% or less with color index below I. 2 cases of P. P. A. with color index above I. 51 cases with greatly decreased RBC. 9 with normal RBC.

tarded emptying time bear out in part the hypothesis of the inhibitory effect of profoundly depressing emotions.[3] This has been well illustrated in the sixty-two cases studied in this paper. Too low values are also obtained at the first examination due to the patient's dread of the introduction of the Jutte tube, in all probability, inhibiting the gastric secretion.

Today, the injection of neutral red dye during or before a fractional test meal is claimed to help differentiate the true from spurious achylias, neutral red being incapable of excretion by an atrophic gastric mucosa; this method has been abandoned in the study of cases reported.

The supreme decision rests, however, with the histamine test, which was used in all the cases studied. Histamine phosphate, 0.5 milligram, is injected subcutaneously after the fasting specimen is aspirated; then specimens are taken at fifteen minute intervals until three samples are obtained. In all cases, except those of true achlorhydria, a gastric secretory response will be noted. There are very few exceptions to this rule. Further difficulties, such as those encountered in discerning the difference between the achlorhydria of early gastric carcinoma and Addisonian anemia, can be overcome by careful x-rays, gastroscopic examinations, and the fact that in carcinoma of the stomach the absence of free acid is frequently, but not always observed; while the total acid shows a higher curve, mounting to twenty, thirty, or forty degrees, which does not occur in primary anemia. The Oppler Boas bacilli are often present, along with blood, and excess of mucus in cancer of the stomach.

The test meal has been abandoned entirely in the series studied for the reason that if one gives bread and water and one hour later aspirates the stomach contents, the pylorus may have remained closed with the bread remaining in the stomach; the gastric juice is thus diluted by the meal; therefore, the acidity will be relatively low. If, in the same subject the stomach has emptied itself during the hour of the test, then there will be less bread and more gastric juice and the acid reading will be higher even if the actual secretion of the stomach has remained constant. Attempts to introduce into practice various tests for gastric secretion from which the element of the meal has been eliminated have met with vigorous objections from many clinicians.[4] It has been argued, especially, that the stomach must be given normal work to do, namely: a meal, in order to test its function. This objection is obviously unsound, as it might be argued

with equal justice that the strength of a muscle could be tested only by cropping tobacco and not by a dynamometer. Furthermore, who can say what is the normal test meal for any particular person? It might be a pound of roast beef or, perhaps, a cake of cornbread with molasses and whiskey. The important point would rather seem to be that a standard stimulus be used which can be repeated in identical form on successive occasions, with the same or different subject, and which is sufficiently powerful to bring out sharply differences in secretory capability. Histamine is a substance which, on subcutaneous injection, fulfills these specifications; by using it, test meals can be avoided and pure gastric juice is obtained for analysis. Normal standards of gastric secretion following histamine stimulation have now been worked out; and with them the aberrations in disease may profitably be compared.

Vanzant, in the examination of 3,746 persons, found a steady increase in the incidence of achlorhydria from youth to old age; twenty-three to twenty-eight per cent of the individuals at the age of sixty failed to show free acid on repeated fractional analysis.[5]

The symptoms of hypoacidity in early stages are usually few because gastric digestion in these cases is vicariously performed by the intestines.[6] However, there is sometimes loss of appetite and a sense of fullness after eating when the condition has existed for a few years. Nausea and vomiting are rare. In some cases, there is severe pain, heart burn, and eructations just as in hyperacidity; sometimes, too, periods of diarrhea and constipation alternate. Headache, drowsiness, constipation, and fleeting joint and neuritic pains are often encountered. The tongue is pale, flabby, broad, and indented by the teeth in the majority of instances.[7] The condition is very often associated with a motor defect and may end in acute dilatation of the stomach with retained gastric secretion that may cause intense pain, relieved only by a hypodermic of morphine sulfate. One such case was encountered in the sixty-two cases studied; this happened to be a syphilitic patient. Stokes finds that hypoacidity is demonstrable in a great majority of patients with syphilis at all ages.[8]

The treatment of hypoacidity is of course directed at the underlying cause or pathlogy. In cases of neurasthenia with mental depression, psychotherapy is of great value; an attempt should be made to lift the patient out of his depression by introducing new interests, such as sports, social or civic work, and religious duties.

The diet should be directed at eliminating coarse fruits and vegetables which contain large amounts of cellulose or connective tissue. Such fruits as are fed should be stewed and all vegetables thoroughly boiled. Because of the high vitamin content, all citrous juices, well strained, should be allowed. Boiled milk, cocoa, tea, coffee are permissible. Practically all fish are allowed. Well prepared broiled and baked meats, with all fibrous and fatty portions removed, are excellent. The supposed effects of broths and bouillons in stimulating the gastric secretion recommends them to the patient with hypoacidity.[9]

Knud Faber, in 1913, reported that microcytic anemia was frequently present in hypoacidity. A hypochromic anemia occurred in every one of the sixty-two cases studied. Ferrous sulfate and liver extracts were used in the treatment of all cases.

The medicinal treatment naturally takes the form of acid therapy and presents many difficulties because of the great diversity of opinion among authorities as to its administration in amounts and time. In the cases here presented a preparation of glutamic acid hydrochloride, 325 milligrams, with thiamine chloride, 100 international units, and riboflavin, 50 Sherman Bourquin units, was used. One to three capsules containing the above were given at the beginning of each meal and often an additional capsule two hours after the meal. The amount of hydrochloric acid liberated from glutamic acid is more than that which could be administered orally in the form of free acid.[10] There have been some reports that glutamic acid definitely inhibits peptic digestion *in vitro*, but this has not been proven *in vivo*.[11] Betaine hydrochloride, N.N.R., liberates hydrochloric acid gradually when it is dissolved in water and has found some favor amongst gastroenterologists; it was used in three of the cases studied, but no advantage could be found, so its use was discontinued.[12] Some clinicians report good results with phenol in one drop doses or one-half grain of phenol in silver coated pills.[13]

Five cases were treated with short wave diathermy in addition to other therapy. All five were suffering severe epigastric pain; the diathermy treatment gave spectacular relief of the discomfort. There has been

reported in the literature nineteen cases of hypoacidity treated with short wave diathermy with cessation of pain and a general increased well-being. No changes were made in the diet and no additional treatment given. The gastric secretion and acidity were greatly improved. Twelve to fourteen treatments of one-half hour each on a fasting stomach were given with pads in back and over epigastric area.[14]

Constipation usually accompanies gastric hypoacidity and demands attention. A practice has been made to combine a "bitter tonic" with a laxative in the treatment of these cases. I have found the old "Quaker Cocktail" used by Sir William Osler at Blockley in Philadelphia extremely satisfactory.

The formula is as follows:

Tincture of Nux Vomica ..... drams II
Sodium Bicarbonate ..... drams III
Fluid Ext. Cascara Sagrada ..... drams I to III
Tinc. Gentian Compound q.s. ad ounces III
Sig. Teaspoonful in one-third glassful of water twenty minutes before meals with cupful of hot water following breakfast dose.

SUMMARY AND CONCLUSIONS.

1. The term "achlorhydria" or "achylia gastrica" should be reserved for cases that show no free hydrochloric acid after histamine injection.

2. Histamine phosphate injection is the best method of obtaining an accurate picture of the secretory function of the stomach.

3. Neurasthenia with depressive states accounts for the majority of cases with hypoacidity.

4. The most common symptomatology encountered in patients suffering with hypoacidity, in order, are flatulence, constipation, asthenia, anorexia, epigastric pain, and generalized neuritic pain with headaches.

5. The greatest number of sufferers fall in the fifth and sixth decades.

6. Every patient studied presented a secondary anemia, except the two cases of Addisonian anemia.

7. Glutamic acid with thiamine chloride and riboflavin, along with attention to the underlying pathology seems to be the most satisfactory treatment.

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THE TREATMENT OF LUNG ABSCESS

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Abscess of the lung is a serious disease with a reported mortality rate, under purely medical treatment, as high as 58 per cent.[1,2,3] When the generally accepted method of combined medical and surgical treatment is used, there is little change in the mortality rate, but the percentages of cures are higher.[4,5,6] Some of the cases which have apparently been "cured" by medical treatment are left with pulmonary damage—bronchiectasis, fibrosis, and emphysema, often resulting in respiratory disability.

Undoubtedly many patients suffering from abscess

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of the lung recover completely and spontaneously, but the percentage of deaths and of cases left with extensive damage to the lung is unwarrantedly high.

In recent months Neuhof and Touroff,[7] Overholt and Rumel,[8] and others have reported mortality rates below 8 per cent, following the early external drainage of lung abscess cavities. This striking contrast with the figures given above is sufficient to make one realize that medical treatment, as practiced generally, has been inadequate. There are probably several reasons for this failure; among the most important are; 1. Failure to make an early diagnosis. 2. A poor understanding of the pathology of lung abscess. 3. A certain degree of complacency regarding the presence of pus within the lung. Abscess of the lung has been generally considered as a chronic disease; and if the patient is not too toxic when first seen one tends to procrastinate.

The low mortality rate and more rapid and complete recovery resulting from early drainage are based upon diagnosis and operation within the first six weeks. Though experience proves that such early diagnosis is often very difficult and not too common, its importance places the greatest responsibility upon the physician.

A knowledge of the etiology and pathogenesis, bacteriology, and especially the pathology of lung abscess is necessary for any logical and successful method of treatment.

ETIOLOGY AND PATHOGENESIS

It has been shown both clinically and experimentally that abscess of the lung is most often produced by passage of infected material through either the blood stream or the air passages. King and Lord[2] report that 56 per cent of the cases in their series followed operations on the upper respiratory tract, and others report comparable figures. Abscess of the lung occurring in these cases may follow aspiration of infected material or the lodging of infected emboli in the pulmonary parenchyma. The incidence of pulmonary emboli is probably higher than is generally thought.

Approximately 10 per cent of the cases in which a predisposing factor can be found follow pneumonias, especially bronchopneumonias which fail to resolve promptly. In these cases bronchial obstruction by plugs of secretion may play a part.

Stern,[9] found that 86 per cent of cases at Mount Sinai Hospital, New York, had advanced dental disease with infected gums and large amounts of dental tartar. Anaerobic organisms are numerous in dental tartar, and Stern believes that the tartar, when aspirated, acts as a foreign body, and aids in the development of lung abscess. It is common to find dental disease in most cases of lung abscess and this may be the initiating factor in the so-called "idiopathic" cases.

Other etiological factors which contribute to pulmonary suppuration, but which are not included in the scope of this paper are tuberculosis, primary bronchiectasis, foreign bodies, tumors arising from the bronchial mucosa, cystic disease of the lung connected with the bronchial tree, and multiple abscesses occurring in the course of septicemia.

BACTERIOLOGY

There is no single bacteriologic agent responsible for lung abscess. It is doubtful if the organism responsible for the original infection can be determined, and for all practical purposes only the secondary invaders are of clinical significance. The question of whether lung abscess is always initiated by pathogenic anaerobes is debatable, but it seems certain that they are responsible for maintaining and extending the original infection. The presence of anaerobic streptococci, fusiform bacilli, and spirochetes indicates that necrosis and gangrene are present, and, consequently, are of grave prognostic significance.

The part that synergism plays in enhancing the pathogenicity of these organisms is not clearly understood, but evidence available seems to indicate that it is considerable.

PATHOLOGY

The diseases variously described as "pulmonary suppuration", "putrid and non-putrid abscess" of the lung, and "gangrene" of the lung are in effect the same fundamental pathological process, and will be described as such.

According to Boyd[10] an area of infiltration is first noted. Liquefaction then occurs in the center, giving rise to a potential cavity containing pus. The wall of the early abscess is ragged, necrotic, and poorly defined. With the advent of anaerobic organisms necrosis becomes extensive, and secretions become foul. The blood vessels in the periphery of the lesion become thrombosed early, and thus produce an area of more or less avascularity around the cavity. This fact probably accounts for the relatively infrequent occurrence of severe hemoptyses. It prevents, however, adequate oxygenation by way of the blood

stream, and if adequate drainage is not established "gangrene" develops.

The most important result of this process of suppuration from the standpoint of treatment is that the semi-solid tissue which sloughs away from the abscess wall forms a mass in the dependent portion of the cavity while undergoing liquefaction. This acts as a plug and prevents proper oxygenation and drainage of the cavity by way of the bronchus.

When the process ruptures into a bronchus one of three things may occur: 1. If oxygenation and drainage are continuously good, complete recovery usually occurs. 2. If oxygenation and drainage are only partially effective, or intermittent, the resistance of the patient may be able to hold the process in check. The abscess then passes into the chronic stage and is walled off by a thick, fibrous, and avascular capsule. This leads to dilatation and distortion of the nearby bronchial tree. 3. If oxygenation and drainage are not adequate, necrosis of tissue and thrombosis of vessels progress, and the patient usually dies from the absorption of bacterial toxins. At any time the process may rupture through the pleura with the formation of a putrid empyema.

DIAGNOSIS

Abscess of the lung is most successfully treated as an acute disease, and early diagnosis is vital. A proper consciousness of the disease and its consequences will be of great assistance.

The clinical picture is usually evident, and though there are no characteristic physical findings in early lung abscess, the onset of cough, followed by profuse expectoration, fever, and other symptoms of sepsis, combined with a history of pleural pain, pneumonia, or recent operation on the upper respiratory tract, makes the diagnosis most probable.

The sputum may not be foul at the onset, but when it becomes so it means that necrosis and gangrene are taking place. Blood-streaked sputum and frank hemoptyses are inconstant findings.

The usual x-ray picture is that of an isolated cavity, surrounded by a zone of density varying greatly in width. It is common to find a fluid level present if drainage is inadequate. One should remember, however, that if the abcess does not connect with a bronchus, or if the bronchus is obstructed, no cavity is seen, and the involved area appears as a localized area of consolidation varying considerably in density.

TREATMENT

In view of the reported evidence lung abscess must be considered primarily as a surgical disease. However, every case of early lung abscess deserves a trial at medical treatment, aimed toward instituting and maintaining adequate oxygenation and drainage. There is no set time limit in which medical treatment may prove itself. Surgery should be resorted to the instant progressive improvement ceases. The case should be followed from the beginning by both physician and surgeon.

Postural Drainage.—This is the fundamental procedure in non-surgical treatment of lung abscess, and all other aids are purely supplementary. It must be fitted to the individual case, and used constantly.

The picture of a patient hanging from the bed with his head almost on the floor is a familiar one. This method of postural drainage frequently has no beneficial effect, and by forcing necrotic tissue within the cavity into the bronchial opening, may actually prevent drainage. Furthermore, it can be used for only limited periods of time, and is exhausting to most acutely ill patients.

Cavity must be localized exactly by the use of x-ray films taken in the posterior-anterior, lateral, and oblique positions, or stereoscopically. This knowledge, combined with a general idea of the course of the larger bronchi, will enable one to select the position in which drainage will be most effective. Changing the position of the bed is far more satisfactory than moving the patient; elevation of either the foot or head of the bed from eighteen to twenty-four inches, does not cause discomfort to the patient and can be maintained indefinitely.

As an example: if an abscess cavity is located posteriorly in the right lower lobe, maximum drainage would be achieved by elevating the foot of the bed, and turning the patient partially on the left side and partially on the abdomen. A pillow will provide comfortable support for this seemingly awkward position. After two to three hours in this position, the head of the bed should be elevated, and the patient turned on the right side and back. This reversal of position maintained for one to two hours, will allow necrotic tissue in the cavity to fall away from the bronchial opening, thus permitting the most effective oxygenation of the cavity, and allowing any secretions which may have gone into other branch bronchi to drain out. This procedure should be carried out all during the day. At night, the

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patient should sleep on the affected side to allow maximum oxygenation, to prevent drainage into uninvolved lung, and to reduce the tendency to cough and expectoration which interfere with rest.

The importance of postural drainage must be explained to the patient to insure maximum co-operation, and it should be carefully supervised. If postural treatment is effective, oxygenation and drainage are adequate at all times, and improvement is progressive, with no evidence of relapse. There are several indications by which the clinical course can be accurately judged:

1. Temperature.—A decrease by lysis is a good sign. A normal, or decreasing temperature followed by a sharp rise to a high level means that there is an intermittent obstruction to proper drainage, or that the disease is progressing. A temperature which remains elevated means that treatment is ineffective, and surgical drainage should be instituted at once.

2. Sputum.—The amount expectorated in twenty-four hours should be collected in a transparent jar to best observe the total amount, layering, and consistency. When drainage is good, the daily total of sputum decreases steadily. A sudden decrease, however, may mean obstruction to drainage. A sudden increase in amount with a rising temperature may mean an increase in size of the cavity or the formation of new ones.

The odor of the sputum is important also, because, when oxygenation and drainage are adequate and healing is taking place, the odor becomes progressively less foul. A persistently foul sputum means inadequate drainage. Sputum raised in the morning is best to use for this daily comparison.

3. X-ray Films.— Weekly films or fluoroscopic examinations (done by the same observer at approximately the same time each morning) should be made without fail. A lesion which is healing will show a progressive decrease in cavity size and in the surrounding zone of pneumonitis. Failure to change is evidence of improper drainage, as is the presence of a fluid level (most often present in the morning).

Bronchoscopy.—This procedure, which is fast becoming available to more and more physicians, has several valuable functions. It is an aid to diagnosis and localization by allowing visualization of the bronchial tree. It is possible by this means to remove material obstructing the bronchus and with the addition of suction, aspirate large quantities of purulent secretions. It would seem, however, that any case requiring repeated bronchial aspiration should be drained surgically.

Arsenicals.—Evidence now available is strongly opposed to intravenous arsenic therapy as a specific for the cure of lung abscess. The tenacity with which physicians have held on to this concept may well be one reason for the failure of many cases to recover. Smith,[11] Lord,[2] Cutler and Gross,[6] and Matson,[12] are all of the opinion that intravenous arsenic plays only a small part in the recovery of a patient with lung abscess.

Keeping in mind the fact that, when necrosis occurs, there is early thrombosis or blood vessels in the wall of the abscess, one can see that a great part of any intravenous medication may never reach the organisms at work in the cavity.

Arsenicals, used in conjunction with postural drainage, are of value in treatment. In the early case, when necrosis is not widespread and before an avascular wall is formed, such treatment may be important. Even in well established cases the use of Mapharsen in 0.04 gm. doses, or Neoarsphenamine in 0.4 gm. doses, given intravenously at five-day intervals, is often beneficial. A patient who is coughing hard and raising large amounts of foul-tasting and foul-smelling sputum is unable to eat properly, and vomits frequently. This is detrimental to general resistance and morale. If this odor and taste can be overcome in part by the use of arsenicals, it is certainly worthwhile.

Supportive Treatment.—This includes the intake of an adequate diet and sufficient fluids; efforts to overcome any anemia by using transfusions, iron, and liver; adequate mouth hygiene, including care of infected teeth and the use of sodium perborate as a mouth wash; and efforts to keep both the patient and his environment as free as possible from the unpleasant odor so often present.

Surgical Treatment.—The procedure of choice in the early case of lung abscess which has not improved steadily under non-surgical treatment, is drainage of the cavity through the chest wall. The procedure is simple and depends primarily upon accurate localization. This method of treatment has resulted in a shorter period of hospitalization, and less residual damage to the lung.[7, 8]

X-ray films taken in the posterior-anterior, lateral, and oblique positions, along with fluoroscopic examination made in the same position as the patient will occupy on the operating table, are of paramount im-

portance. The history is of value, as pleural involvement, due to the peripheral location of almost all abscess cavities, occurs early, and the patient has often had fairly well localized pleural pain. Sometimes palpation of the intercostal spaces reveals a "tender" spot. Neuhol locates the cavity by fluoroscopy and injects a small amount of lipiodol mixed with methylene blue into the overlying intercostal space. Stereoscopic x-ray films then will enable one to see the exact relationship between the lipiodol and the cavity. The methylene blue becomes a valuable guide at the time of operation.

Whether or not the operation is done as a one or two stage procedure depends upon whether pleural symphysis has taken place, and the accurateness with which the adhesions are localized. If the work-up is exact, one stage usually suffices.

The operation is performed under local anesthesia. A two-inch segment of one rib is removed through an incision three to four inches long. The periosteum is removed along with the segment of rib, and the intercostal nerve is crushed to make post-operative care less painful. If pleural symphysis has taken place, the cavity is then opened by an electric cautery, or a pair of scissors. An opening one inch in diameter is sufficient, and will admit a small light for examination of the interior, and the thorough removal of all gangrenous slough. Some operators use oxidizing agents such as zinc oxide paste, applied locally, after the cavity has been thoroughly cleansed. A gauze pack and a tight dressing completes the procedure, and the cavity is allowed to close by means of granulation tissue arising from the base of the cavity.

SUMMARY AND CONCLUSION

Abscess of the lung is a serious disease, which under generally accepted medical treatment has resulted in extensive pulmonary damage and a high mortality rate. The incidence of spontaneous and complete recovery is not known. Early surgical drainage has brought about a striking reduction in this mortality rate.

Most cases of lung abscess follow operations upon the upper respiratory tract, or occur subsequent to pneumonias which do not resolve promptly. In so-called "idiopathic" cases, the incidence of oral infection is extremely high. Careful treatment of these varied entities is important in the prophylaxis of lung abscess.

The bacteriology of lung abscess is complex. Isolation of the original infecting organism is virtually impossible. Anaerobic organisms, as secondary invaders, are responsible for maintaining and extending the disease. Synergism is probably an important factor.

A knowledge of the pathology of lung abscess is essential to an understanding of previous failures in treatment, and in carrying out a logical and successful method of treatment.

Every case of lung abscess deserves a trial at medical treatment, providing adequate oxygenation and drainage can be established at once and maintained continuously. Failure to accomplish this is the indication for immediate surgical drainage.

The external drainage of lung abscess cavities is a simple, logical, and successful surgical procedure.

Note: The author wishes to express his gratitude for the advice and assistance of Dr. J. Maxwell Chamberlain, Principal Thoracic Surgeon, New York State Tuberculosis Hospital, Oneonta, N. Y., in the preparation of this paper.

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LIGNIN TEST FOR SULFONAMIDES

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Since the introduction of the sulfonamides in the treatment of infectious diseases, several deplorable accidents have taken place. The elixir sulfanilamide caused about seventy deaths before it was taken out of circulation; the number of deaths caused by the sulfathiazole tablets which have been contaminated with phenobarbital has not been disclosed thus far. It appears accordingly purposeful to have a simple test on and for the exclusion of sulfanilamide and its derivatives. As my own experiences seemed to suggest, the old test developed by Runge and others for lignin could be worked out for this purpose.

Runge[1] has shown that salts of aniline produce an intense yellow color on fir wood when hydrochloric acid is added to the solution. Subsequently A. W. Hoffmann[2] found the same property in the salts of toluidine, chinoline, leucoline and others. That this property was not restricted to firwood was later shown by S. Scharpringer[3]; any kind of wood exhibited the same color reaction when brought in contact with the reagents. Scharpringer believed this phenomenon to be connected with the presence of "Holzzeug" (lignin) in any kind of wood giving the color reaction. He recommended the evaluation of this property for the purpose of testing lignin in wood, and especially of paper for the content of wood fiber (lignin) in it. H. Singer[4] claimed the color reaction to be connected with the aldehydes and especially with vanillin contained in the wood fiber. Czapek[5] was busy isolating the reacting matter out of the wood; he named it hadromal and found it to be an aldehyde but he could not convince himself that it was vanillin which gave the color reaction. As a matter of fact vanillin is still used with phloroglucin for hydrochloric acid determination.

The sulfonamides are aniline derivatives and accordingly they have proved to react in the same way with wood fiber like the other aniline derivatives. The acid used by the writer to test the sulfonamides was concentrated hydrochloric acid. A tablet containing sulfanilamide, sulfapyridine or sulfathiazole was dissolved in water which, due to the poor solubility of these sulfonamides, resulted in a suspension. Concentrated hydrochloric acid was added and increased the solubility. The resulting suspension was colorless. A wooden applicator was immersed in the solution and, after a time, the immersed part of the applicator showed a beautiful orange-yellow color, the solution remaining colorless. The applicator was immersed again in the colorless solution and used as a pen to write on a newspaper. Almost immediately the colorless fluid appeared on the paper in bright orange-yellow letters which proves that most of the daily newspapers are printed on paper made out of wood fiber. No color could be produced on rag paper. A solution of 1:10,000 produced a faint but still visible orange-yellow color.

To test a solution for the presence of sulfonamides, this solution should be acidified by hydrochloric acid and hydrochloric acid added in excess. If a wooden applicator or a strip of lignin paper turns orange-yellow in color, the presence of sulfonamides is probable. A negative reaction would absolutely exclude for practical purposes the presence of sulfonamides in tested tablets. In a test solution the presence of sulfonamides in a concentration of more than 1:10,000 could be excluded in this way.

This experiment has shown:

1. That like other aniline derivatives the sulfonamides can be used for the detection of lignin in the presence of acids.

2. That this lignin test can be used as a non-specific but indicative test in testing of sulfonamides.

3. That a negative lignin test practically excludes the presence of sulfonamides in a concentration of more than 1:10,000 in a test solution.

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SELECTED CASE REPORT OF MATERNAL DEATH

MATERNAL HEALTH COMMITTEE
MEDICAL SOCIETY OF VIRGINIA

The patient was a 23 year old colored multipara with one previous pregnancy who was seen at home by a physician at the eighth month of pregnancy, in labor and with the membranes ruptured. She had been in labor for fifteen hours and had been bleeding in excess passing some fairly large clots. She gave the history of having had some painless vaginal bleeding periodically for one week before the onset of labor. After observing the patient for one hour of labor without progress and with continued bleeding, the physician referred her to a hospital.

At the time of admission to the hospital the temperature was 98.6, pulse 140, respirations 20 and blood pressure 100/70. Vaginal examination revealed a transverse presentation with a prolapsed hand. The cervix was 8 cm. dilated and rigid and she was thought to have a marginal placenta previa. No fetal heart sounds were heard. The bleeding continued and it was decided that she should be delivered. Under ether anesthesia, two incisions were made in the cervix, the cervix then manually dilated and a version and extraction done. The infant weighing five pounds was still-born. The cervix was repaired immediately.

It had been estimated that the blood loss amounted to approximately one pint before admission to the hospital and about a quart during delivery. The bleeding postpartum was not excessive, but her condition remained very poor. It was stated that she was not given a venoclysis or transfusion because of the circulatory collapse although a suitable donor was obtained. She was given a hypodermoclysis and stimulants. It is stated that ten hours postpartum she was cold and clammy and in great distress. It was decided to give her a transfusion then, but she died before it could be started (eleven hours postpartum).

This has been classified as a preventable obstetrical death, because of the absence of prenatal care, the failure to seek medical attention at the onset of the bleeding, and the failure to seek medical attention at the onset of labor. These failures were due to neglect or ignorance on the part of the patient and her family. In addition the failure on the part of the hospital physicians to utilize an approved method of treatment for placenta previa of itself justifies the classification of the present case as preventable.

In the case report of last month the approved methods of treatment of placenta previa at the present time were briefly outlined. The presence of an abnormal presentation is a common finding in placenta previa, and as was the case in the present instance, seriously complicates the treatment. One member of the committee makes the statement that the present case was an ideal one for Braxton Hicks version with slow delivery, a statement with which the entire committee is in accord.

The most serious failure on the part of the physician was the failure to replace blood loss by blood plasma, or fluids. It was generally agreed that transfusion should have been done first rather than attempted last. A pulse of 140 and blood pressure 100/70 at the time of admission indicated immediate efforts at replacement of blood volume, before attempts at delivery were made. The administration of blood or plasma should have been continued during the delivery and afterwards until the patient had recovered from the hemorrhage. In view of these obvious failures on the part of the patient, her family, and the attendants, it is felt that this should be considered as a preventable death.

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Public Health Statistics

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State Health Commissioner of Virginia.

The report of the Bureau of Communicable Diseases of the State Department of Health for April 1942, compared with the same month in 1941, and for the period of January through April 1942, compared with the same period in 1941 follows:

	APR. 1942	APR. 1941	JAN.-APR. 1942	JAN.-APR. 1941
Typhoid and Paratyphoid Fever	3	9	45	42
Diarrhea and Dysentery	64	86	361	226
Measles	968	9,214	3,340	23,193
Scarlet Fever	103	139	595	732
Diphtheria	24	27	179	150
Poliomyelitis	2	3	3	9
Meningitis	17	21	69	45
Undulant Fever	2	0	8	3
Rocky Mountain Spotted Fever	0	3	1	4
Tularaemia	1	0	19	15

CHEMICAL WARFARE INSTRUCTION

The Emergency Medical Service for Civilian Defense in the State has arranged periods of intensified instruction for the physicians in Virginia on the action of war gases and measures to be adopted for protection.

Instructors already have been selected and trained for this purpose. The course on chemical warfare was given at the University of Cincinnati and at the Kittering Laboratory. Demonstration and instruction were held for a period of three days. From this school a group was selected to lecture to the medical societies in the more congested defense areas of Virginia.

The preparation of these chemical agents is described. Composition and physical properties are stressed so that toxicity and irritability in relation to volatility, dispersion and absorption by the body are clearly understood.

Some of these gases are quite similar in their effect upon the human organism. Those gases that are lung irritants and cause death due to pulmonary œdema and circulatory collapse are recognized not only by the physical findings of the patient, but by the length of time in which they take to act and the characteristic odor they impart to the contaminated.

The visicants or blister gases in turn possess other properties that render them identifiable. They are volatile oils rapidly absorbed by the skin. Irritation as time progresses becomes extreme and the final results appear to be a second or third degree burn often accompanied by a toxemia so severe that death results.

Tear gases, irritant smokes alone or in combination with others, affect the entire environment of man exposed to them. His water supply, his food and his domestic pets may become poisonous and dangerous to him on contact.

In the hands of the physician rests the responsibility of maintaining the safety of civilians in a chemically contaminated area. His recognition of the poisonous agent and the institution of the proper means of decontamination and treatment will result in either a successful raid for those who would bring these poisons to our shores, or success for us with the continuation of our health and war effort.

The men who have devoted their spare time to give these illustrated lectures are Dr. William Grossmann, Assistant Chief of Emergency Medical Services for the State of Virginia and Director of the Bureau of Communicable Diseases, State Health Department; Dr. H. B. Mulholland, Professor of the Practice of Medicine, University of Virginia Department of Medicine; Dr. J. C. Forbes, Associate Professor of Bio-Chemistry, Medical College of Virginia; Dr. E. C. Harper, Director of Tuberculosis Out-Patient Service and Crippled Children's Bureau, State Health Department; Dr. Harry Walker, Associate Professor of Medicine, Medical College of Virginia.

These lectures are considered to be not only timely but necessary. The interest that has been aroused in the potential danger which confronts us has caused an unprecedented attendance by the physicians of the various societies before which the lectures were delivered. The academies of Norfolk, Newport News, Portsmouth and Richmond have been visited. In the near future, this group will appear before many of the societies throughout the State.

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Mental Hygiene Activities

Social Work and Mental Hygiene Conference.

Social workers, mental hygienists, public health workers, medical care enthusiasts, and even religionists, had their say in the conference at Richmond, which closed at noon on Saturday, April 25. It was a most interesting and instructive meeting geared to the wartime effort, and should prove inspirational and helpful to all workers who are earnestly and sincerely trying to do something to alleviate the distress, suffering, and only too often the utter helplessness of a large segment of our Virginia citizenry. Mrs. Marion Yingling Frost and her capable fellow conference officers deserve the highest praise for the preparation and execution of the very excellent program.

The Mental Hygiene Society of Virginia was, as usual, charged with the responsibility of arranging the mental hygiene part of the conference. Dr. Howard R. Masters and Dr. David C. Wilson are to be congratulated on the high type program for the public meeting on Wednesday evening, April 22, and for the mental hygiene section on Friday. The speakers were of the best and without question gave a clear and understandable picture of the effects of the war on present social economies as they are related to the civilian population and armed forces. The speakers and their topics were as follows:

WEDNESDAY EVENING, APRIL 22,

Dr. Frank Redwood, presiding

Address: "Bacteria — Rumors — Propaganda — War."

By Dr. C. Charles Burlingame, Psychiatrist-in-Chief of the Neuropsychiatric Institute of the Hartford Rétreat, Hartford, Connecticut, and Chairman of the Committee on Public Education of the American Psychiatric Association.

Address: "Propaganda and its Antidote"

By Mr. L. R. Pennington, Inspector, Federal Bureau of Investigation, Washington, D. C.

Discussion Period: Led by Mr. Hugh R. Pomeroy, Director of the Virginia State Planning Board, representing the Virginia Defense Council.

FRIDAY MORNING, APRIL 24

Dr. David C. Wilson, presiding

Theme: "Mental Health In War Times."

Address: "The Effect of War on the Armed Forces."

By Dr. Douglas A. Thom, professor of Psychiatry at Tufts Medical School, Boston, Massachusetts.

Address: "The Effect of War on the Mental Health of the Civilian Population."

By Dr. James B. Pettis, Former Clinical Director of the Western State Hospital, Staunton, Virginia, and now Lieutenant-Commander in the United States Navy, Norfolk, Virginia.

Discussants: Dr. R. Finley Gayle, Jr., and Dr. Joseph E. Barrett.

FRIDAY AFTERNOON, APRIL 24

Dr. David C. Wilson, presiding

Theme: "Effect of War on Delinquency and Crime."

Address: "The Effect of War on the Behavior of Children."

By Dr. Harvie DeJarnette Coghill, Director of the Children's Memorial Clinic, Richmond, Virginia.

Address: "Crime in Wartimes."

By Dr. James A. Nolan, Professor of Sociology at George Washington University, and Director of the Washington, D. C. Criminal Justice Association.

Discussants: Dr. Emily Gardner, Judge J. Hoge Ricks, and Mr. William J. Barron, Assistant Dean of the Law School of the University of Virginia.

SATURDAY MORNING, APRIL 25

Due to the inability of Miss Sue R. Slaughter of Norfolk, and Dr. Victor H. Vogel of Washington, D. C., to fill their speaking engagements, the meeting scheduled for this period was held jointly with the Public Health and Medical Care Section, Dr. William Bickers, presiding

Mr. John Lewin, Counsel for the United States Government, and Mr. Seth Richardson, counsel for the American Medical Association, presented their opposing views as they had been developed in the famous trial involving the Group Health Association Incorporated, of Washington, D. C.

Submitted by F. W. GWALTNEY, Executive Secretary, The Mental Hygiene Society of Virginia.

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Woman's Auxiliary to the Medical Society of Virginia

President—MRS. E. LATANE FLANAGAN, Richmond.
President-Elect—MRS. H. W. ROGERS, Norfolk.
Recording Secretary—MRS. HAROLD W. POTTER, Hilton Village.
Corresponding Secretary—MRS. A. S. LILLY, Richmond.
Treasurer—MRS. REUBEN F. SIMMS, Richmond.
Chairman, Press and Publicity—MRS. HENRY M. SNEAD, Petersburg.

Auxiliary to Accomac and Northampton Medical Societies.

The regular meeting of this Auxiliary was held at Kendall Grove on April 14th. The first portion of the afternoon was given over to an oyster roast in Cleveland's special domain were the cheery red table cover vied with the wall decoration of cards from past Christmases for interest, and a menu of oysters both raw and roasted, sandwiches, potato salad and all the other trimmings was given due consideration by all present.

Following this, the members adjourned to the parlor in Mrs. Costin's home for a short business session after which the meeting was turned over to the Program Committee. Mrs. Ames read a short article on "The Modern Florence Nightingale", after which Mrs. Cosby introduced our guest of honor, Mrs. E. Latane Flanagan of Richmond, president of the Woman's Auxiliary to the State Society. Mrs. Flanagan gave a very comprehensive idea of this year's work of the State Auxiliary with special attention to the way the Auxiliary works for better medical legislation, and some of the problems it meets. Her closing remarks were to us as individuals: "Buy defense bonds and stamps. Pray for peace but work for war."

Those present were Mrs. E. H. Trower, President, Mesdames Green, Jackson, Holland, Lynch, Henderson, Ames, Denoon, Cosby, S. S. Kellam, Hamilton, Gladstone and Garrett.

The Auxiliary to the Williamsburg-James City Medical Society

Held its May meeting on May 5th, at 6:30 p. m. at Bruton Parish House. In addition to the regular members, the wives of a number of army doctors stationed in the district were present. Dinner was served by the ladies of Bruton Parrish church, and Mrs. E. Latane Flanagan, President of the State Auxiliary, was the guest of honor.

After dinner the usual order of business was set aside to allow the members and guests to hear a talk by Mrs. Flanagan. She stressed the responsibility of the doctor's wife in wartime and the important part she has to play in helping to guard the health of the community. She also told of the work done in the last legislature to strengthen the medical practice laws, and stressed the fact that though the Auxiliary did a good deal of work, there was no active lobbying, and no legislator was directly approached by the women.

After the meeting the members stayed for awhile to enjoy a dance that was being given that night at the Parish House to soldiers from Fort Eustis.

Book Announcements

Night of Flame. By DYSON CARTER. Reynal & Hitchcock, Incorporated. New York. 1942. 337 pages. Cloth. Price $2.50.

Directory of Medical Specialists. Certified by American Boards. 1942. Published for the Advisory Board for Medical Specialists. Columbia University Press, New York. 1942. 2495 pages. Cloth. Price $7.00.

This second edition contains the names of 4,000 more specialists than did the first edition issued in 1939. This brings the total number of names from 14,000 up to 18,000. Part of this increase is due to the inclusion of a new specialty on neurological surgery. The general plan and arrangement remains the same, but much new material has been added, bringing the number of pages from 1573 up to 2,500. This new edition will thus be much more useful to many more people than was the old edition.

E. C. L. MILLER, M. D.

Essentials of General Surgery. By WALLACE P. RITCHIE, M.D., Clinical Assistant Professor, Department of Surgery, University of Minnesota Medical School. St. Louis. The C. V. Mosby Company. 813 pages. With 237 illustrations. Cloth. Price $8.50.

This book is intended to be an introduction to surgery for the benefit of undergraduate training and study. It is a good deal more than that. It tells in clear, concise, outline-form, all of the essentials of surgery, as the title implies. It is not meant to be used as a textbook, or as a substitution for a textbook. It is to be used as a guide for the thorough study of surgical material.

There is very little left out that could have been included. The outlines, summaries, anatomical considerations, symptoms, and other subtitles are each one worthy of comment because they are so terse and pertinent and easily read and remembered.

The book has a further use in the preparation for an examination for those in graduate training or beyond. It is a quick method of refreshing the mind with some of the details that might have been forgotten.

The sections on orthopedics, urology, and neurology are as well handled as the rest of the volume. The outline of fractures is as good as will be found in any textbook. In fact all parts of this book are well done, and I believe it will have a wide sale.

It seems incredible that there was a need for such a volume as this one in the field of surgery. But when one reads through this book several times and refers to it in reference again and again, one realizes that in no other could he so satisfactorily find the answer to his query. It is a worthy companion to Horsley & Bigger's *Operative Surgery*. It seems to include all that these volumes left out and vice versa. The shorter volume, though, will have less widespread attraction. H. C. L.

Cancer of the Face and Mouth. Diagnosos, Treatment, Surgical Repair. By VILRAY P. BLAIR, M.D., SHERWOOD MOORE, M.D., and LOUIS T. BYARS, M.D., St. Louis. The C. V. Mosby Company. St. Louis. 1941. 599 pages. Illustrated. Cloth. Price $10.00.

The present-day knowledge of cancer of the face is completely presented in this excellent treatise out of St. Louis and Washington University. Seldom do we find a book that so completely covers a given field. The chief delight in this volume is the numerous and varied illustrations. The pictures are of actual cases and well presented to show all gradations of the disease process. The pictures are not pretty, but it seems amazing that one volume could collect such a group of illustrations.

The book is well broken up into chapters and easily read, even by one not well acquainted with the subject. It is the ideal reference book and is among those volumes to which one can refer for a complete summary of modern therapy in a given malignant condition of the face.

The chapter on five-year results is very interesting and will act as a comparison table for future series, even though this series is still small. The chapter on anesthesia ably presents the problems dealing with the mechanics and technics of administration.

The numerous plates showing the operative technic are well done in the clarity of their presentation. They are poorly spaced in the book, however, and take up too much unnecessary space.

The book can be heartily recommended to all interested. It will be a manual to all specialists in this field, but beyond that, it should be accessible to all surgeons, roentgenologists, and tumor clinics.

H. C. L.

Infant Nutrition. A Textbook of Infant Feeding for Students and Practitioners of Medicine. By WILLIAM McKIM MARRIOTT, B.S., M.D., Late Professor of Pediatrics, Washington University School of Medicine; Physician in Chief, St. Louis Children's Hospital, St. Louis. Revised by P. C. JEANS, A.B., M.D., Professor of Pediatrics, College of Medicine, State University of Iowa, Iowa City. Third Edition. St. Louis. The C. V. Mosby Company. 1941. 475 pages. Cloth. Price $5.50.

It is gratifying that Dr. Marriott's excellent book has been revised by one so capable as Dr. Jeans. Dr. Jeans, who is now Professor of Pediatrics at the State University of Iowa, has not changed much of the familiar text of the two earlier editions. Essentially he has brought up to date the information on vitamins, added several new growth charts and some data regarding the use of chemotherapy in dysentery and pyelitis. Five new pages are devoted to allergy and its place in relation to the other problems of infant feeding.

The physiological basis for the choice of various foodstuffs, their important chemical characteristics, and details regarding their use are given. While most practitioners will probably recognize the proprietary preparations by their description, the practical application of the principles discussed would be aided by a chart listing their names along with their principal ingredients. This would avoid reference to another source suggested by the authors.

The unaware student should be warned that the doses recommended for several of the drugs at 6 months and 1 year of age are very much larger than those in present use except in unusual circumstances.

The criticisims are minor. Between the covers of no other book can one find such a review of the best current opinions on infant feeding.

B. M. KAGAN, M. D.

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VIRGINIA MEDICAL MONTHLY

Official Publication of the Medical Society of Virginia

(Founded by Landon B. Edwards, M. D., April, 1874)

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Editorials

The Place of the Small Book in Medicine

WE have become accustomed to large and weighty medical books, and to the impressive systems of medicine, which, until a few years ago, practitioners and even medical students, led by the weight of tutorial opinion, mortgaged their futures for. The little volumes which from time to time have come off the medical press in a world of big books have had a hard struggle. Publishers have not liked them. They have found that to market a large book it is not much more expensive than to market a small one, and the larger returns from the former are more inviting. What chance has a $2.50 book of making a go of it for its backers, as against a $15.00 book, when advertising and other selling costs are about the same for both? Ambitious medical authors, their shelves lined with the monumental tomes of their dead predecessors and their living confreres, have envisioned, not smaller, but larger products of their own pens, and with the lush prolixity of undisciplined writing, have thrown out bait for a gullible reader in still more wordy volumes. Professors, expected to know more and more about less and less, have also written big books and recommended big books. They are positively afraid of condensation in their field. Something might be omitted. Something might not be complete. You'd better tell more than the truth than less the truth.

And so it has gone on. But now we must call a halt. Now we must be reasonable and stop despising the small book. If we were more familiar with Sixteenth and Seventeenth Century medicine we should have more respect for small books. Those beautifully bound little volumes of Galen, Glisson, Celsus, Rhazes, Tulp and others, which doctors of a former day took around in their pockets, are wonderful. A great deal of meat can be packed into a small book. Precious parcels often come put up in small packages. Compendiums, synopses, manuals, and epitomes have a real place in

the student's life. Undergraduates and practitioners have often blessed the authors of such little books, for they sometimes can present all the salient facts in clear and concise form without sacrifice of literary merit and at a reasonable price. We cannot of course get along without the systems of medicine, the encyclopedic volumes, but no more can we get along without the abstracts, the summaries, the brief statements of basic facts.

Worthy of mention in this connection, as examples of the value of small books, are two which have just been published by the C. V. Mosby Company. The first is a Synopsis of Materia Medica, Toxicology and Pharmacy by F. R. Davidson, in its second edition. It is a handy and up-to-date presentation with an appropriate inclusion of the latest sulfonamides, vitamins and endocrine preparations. The other, also in its second printing, is a synopsis of Ano-rectal Diseases by Louis J. Hirschman. In addition to the brevity of its presentation, it has to recommend it particularly good illustrations. Both books will find a place for themselves.

The Role of the Allergist in National Defense

COLONEL Hugh J. Morgan, Jr., professor of medicine at Vanderbilt University School of Medicine, now chief of the Medical Subdivision of the Professional Service Division of the Army, spoke to the Society for the Study of Asthma and Allied Conditions at their annual Atlantic City meeting on May 2nd. He told the large group of assembled allergists, obviously anxious to pursue their calling and to serve their country at the same time, that the Army did not need their specialty badly enough to promise to keep its volunteers in their own field once they put on the uniform. He did not say it as bluntly as this, because he had twenty minutes in which to point out the reasonableness of the position taken by the Surgeon General's Office.

In the last war about 7,000 asthmatics were admitted to the various hospitals of the army, and a great deal of allergy was to be found among the fighting forces. In this war it is proposed to keep all "significant allergy" out of the service. This is the job of the Selective Service local boards and of the regional induction boards. Already some 8,000 cases of asthma have been turned up by these boards in the examination of some 200,000 registrants. Some "significant allergy" has, of course, gotten by them, and such cases are slated for the Veteran's Hospitals (Facilities). If there is to be no "significant allery" in the army there is obviously no reason to have allergists.

Colonel Morgan promised that an allergist who found himself on the staff of a general hospital would probably be given work suitable to his training, but he was obliged to add that this would depend somewhat on the attitude towards the specialty of the chief of the individual medical service. One gathered from his remarks that most allergists in the army would find themselves functioning as internists, and if he indicated that for some of them the experience would not prove an unhappy one, he meant no reflection upon the specialty, but was only reminding his hearers that all specialists function most soundly when their sense of proportion is keen and their sense of values is profound.

More Statistics

AT last we have enough statistical data based on analysis of reports of physical examinations of draftees to tell us something about the health of America's man power between the ages of 18 and 36. National headquarters of the selective service

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system in its Medical Statistics Bulletin No. 1 informs us that "about 50 per cent of the approximately two million registrants who have been examined have been found to be unqualified for general military service by Selective Service local boards and Army induction stations because of physical, mental and educational reasons. Of the approximately one million registrants who were not qualified for general military service, 900,000 were so classified because of physical and mental defects and 100,000 because of the lack of educational qualifications. Of the 900,000 rejected for physical and mental reasons, 470,000, or 23 per cent of those examined, were qualified for limited military service, and 430,000 or 22 per cent of those examined, were disqualified for military service."

Roughly, then, out of two million men examined, one million or 50 per cent proved to be qualified for military service; 500,000, or 25 per cent were available in a limited capacity; while another 500,000, or 25 per cent, were not qualified for any type of service at all.

The principal causes of rejection, in the order of their importance were: dental defects, 20.9 per cent; eye defects, 13.7 per cent; diseases of cardio-vascular system, 10.6; of the musculo-skeletal system, 6.8; venereal diseases, 6.3; mental and nervous diseases, 6.3; hernias, 6.2; ear defects, 4.6; defective feet, 4; pulmonary diseases including tuberculosis, 2.9; and miscellaneous defects, 17.7.

The army induction boards seem to justify their existence by rejecting 15 per cent of the selectees previously passed as acceptable by the local boards.

It is heartening to learn that of the 900,000 originally disqualified for military service, at least 200,000 can be completely rehabilitated. This is the more understandable when we are told that half of this number have correctable dental defects.

The value of such statistics lies in the use made of them. What are we going to do about the 100,000 young men whose educational qualifications do not permit them to carry a musket? What are we going to do about the 700,000 who cannot be rehabilitated? If, as a result of the war, we can reduce the high incidence of illiteracy and physical unfitness that selective service statistics have brought to light, one consolation for blood, sweat and tears will have been discovered.

A Medical Board on Tour

IT is becoming increasingly apparent that the Army is in critical need of more nurses and doctors. It has been stated on good authority that Virginia must supply at least eight hundred more physicians to the Armed Services within the next nine months. In this connection it will be of interest to doctors in this State to know that a Board of Army officers is now touring Virginia with the purpose of interviewing every doctor not already in the military services.

The duties of this Board will be made easier if physicians generally will inquire when the Board's schedule will permit it to visit their locality, and seek out the Board for the information and guidance it is prepared to give. The Virginia Procurement and Assignment Service deserves our support. It is no easy task that has been laid upon these servants of the Medical Society of Virginia who are now giving largely of their time and energy for the common cause.

Department of Clinical and Medical Education
of the
Medical Society of Virginia

Postgraduate Programs.

During the past month assistance was given the Clinch Valley Medical Society in its program held at Norton, Virginia, on May 2. Following a noon luncheon the following program was presented:

1. "Circulatory Failure Associated with Trauma-Shock."
   Dr. Everette I. Evans, Resident in Surgery, Medical College of Virginia.
2. "Supervision and Treatment of Cardiovascular Conditions in Industry."
   Dr. Maxwell Berry, Mayo Clinic, Associate in Medicine at Medical College of Virginia.
3. "The State Health Department's Program in Industrial Hygiene."
   Dr. J. B. Porterfield, Director, Bureau of Industrial Hygiene, State Health Department.
4. "Modern Burn Treatment."
   Surgical Staff—Medical College of Virginia.

Recent Pamphlets.

Public Health Reports, U. S. Public Health Service, Vol. 57, No. 17, April 24, 1942.

This pamphlet deals with the following topics:
Cadmium Poisoning in Industry
Epidemic of Boils Among Tunnel Workers
National Defense in Southeastern States
Illness among Employees of a Public Utility

The article on National Defense in Southeastern States may be of especial interest to Virginia doctors. It includes a discussion of extra-cantonment activities, mosquito control, community facilities law, milk sanitation control, general sanitation, and military maneuvers. The purpose of the article is to acquaint health workers and others with the efforts of the Federal Government to meet defense sanitation emergencies.

The concluding article deals with prevalence of disease and includes a report on each state of the United States for the week ending April 18, 1942. A sharp decline in the incidence of meningitis is noted. There are also reports from larger cities for the week ending April 4, 1942.

Venereal Disease Information, U. S. Public Health Service, Vol. 23, No. 3, March 1942.

This bulletin is prefaced with an article by Dr. Frank H. Lahey, President of American Medical Association, entitled "The Private Physician Today in the Control of the Venereal Diseases". Dr. Lahey concludes that "As private physicians, our responsibilities are of a dual character: (1) We must be prepared to play our part in the medical control of venereal diseases in our offices and in the public treatment centers, and in our professional capacities we should confine ourselves to the medical aspects of the situation. (2) As responsible citizens in a democratic community—and as citizens with certain special experiences—we must play our part in the total community attack on venereal disease and on the conditions which foster its maintenance and spread."

A rather full report on "The Management of Gonorrhea in General Practice", by the Executive Committee of the American Neisserian Medical Society, deals with prophylaxis, diagnosis, and treatment and special reference to the use of the sulfonamide drugs. There are also numerous annotated references on the various medical and social phases of the subject.

The above pamphlets may be obtained for five cents from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., or from the Executive Secretary, Department of Clinical and Medical Education, Box 1487, Charlottesville, Virginia.

G. B. ZEHMER,
Executive Secretary.

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Societies

The Patrick-Henry Medical Society

Held its quarterly meeting on April 17th, in Martinsville, with the President, Dr. Gustave B. Dudley, presiding. Sixteen members were present.

Mr. E. A. Sale, City Co-ordinator in the Defense Program, explained the defense program briefly and asked the Society to appoint a member as chief of the emergency medical service and to select a place as headquarters where the chief medical officer is to report and where all physicians are to call in during an alert. Dr. F. B. Teague was appointed chief medical officer and the Shackelford Hospital was established as headquarters.

A motion was made and passed suspending the dues of all members called to military service but allowing them to retain their privileges while away.

The problem of rationing tires and autos to physicians in Patrick and Henry counties was discussed.

The guest speakers, Dr. J. P. Rousseau, radiologist, and Dr. Fred Garvey, genito-urinary specialist, of the Bowman Gray School of Medicine in Winston-Salem, N. C., discussed very ably the subject of "Anomalies of the Genito-urinary Tract". Case studies were illustrated by means of x-ray films and lantern slides.

The next meeting of the Society will be on July 10th.

H. M. PRICE,
Secretary-Treasurer.

The Tazewell County Medical Society

Held its regular bi-monthly meeting on May 14, in Tazewell, at which time Dr. Henry Davis of Bluefield, presented a paper on "Some of the Less Discussed Uses of the Sulfonamides" and Dr. W. R. Strader of Richlands read a paper on "The Toxic Effects of the Sulfonamides".

At the business meeting the members of the society voted to co-operate with the Farm Security Administration in setting up a plan by which the clients of the above mentioned agency could obtain medical care. An executive Committee to help work out this plan was appointed as follows: Drs. A. D. Parson, Richlands, A. Wilson Brown, Pocahontas, Henry Davis, Bluefield, and M. E. Johnston, Tazewell.

Dr. A. Wilson Brown of Pocahontas and Dr. E. L. Hirsley, of Jewell Ridge, were elected members of the local society.

It was decided that the next meeting should be held on July 9, at the Tazewell County Country Club at which time the members of the Buchanan-Dickenson, Russell and Mercer County Medical Societies would be invited to attend.

Dr. Rufus Brittain, of Jewell Ridge and Dr. M. E. Johnston of Tazewell were elected delegate and alternate, respectively, to the State meeting, October 5-7.

Fairfax County Medical Society.

This Society met on May the 14th at the home of its secretary, Dr. Alice Kiessling in West Falls Church, at which time the U. S. Public Health Service film, Syphilis, in sound and color, was shown. Dr. L. F. Hobbs of Alexandria was elected to associate membership. Dr. W. D. Chase of McLean and Dr. Sigmund Newman of Vienna were elected delegate and alternate, respectively to the Society meeting in Roanoke.

The defense set-up of Fairfax County and other business matters were discussed. Following this, the meeting adjourned for refreshments.

The Roanoke Academy of Medicine,

At its meeting on May the 4th, elected the following officers for the year beginning with the October meeting: President, Dr. Paul Davis; vice-presidents, Dr. A. M. Groseclose and Dr. Charles Irvin; and secretary-treasurer, Dr. Ruth Barnhart, all of Roanoke. Drs. J. M. Green of Ferrum and M. H. McClintic and John O. Hurt of Roanoke were elected to membership.

After the business meeting, Dr. Alexander McCausland, Physician at the Hercules Powder Company, Radford, presented an interesting paper on Toxicology of Tri-Nitro-Toluene. A social period with light refreshments followed.

Dr. Mortimer H. Williams and Dr. H. B. Stone, Jr., are the retiring president and secretary.

Hanover County Medical Society.

Officers elected at the annual meeting of this society are: President, Dr. J. A. Wright, Doswell; vice-president, Dr. A. E. Murray, Beaverdam; and

secretary-treasurer, Dr. J. D. Hamner, Jr., Ashland.

Southwestern Virginia Medical Society.

This Society held its annual spring meeting in Wytheville on April 23rd under the presidency of Dr. W. C. Caudill, Pearisburg. The following program was presented: Infections of the Hand by Dr. R. H. Grubbs, Christiansburg; Acute Hematogenous Osteomyelitis by Dr. Thomas H. Kuhnert, Bristol; General Treatment of Burns by Dr. J. Gordon Rennie, Pulaski; Treatment of Asthma by Dr. R. A. Morison, Abingdon; 30,000 Army Examinations on Southwest Virginia Boys by Captain Joseph M. Dixon, M. C. There was then a short business session, followed by dinner, after which the program was resumed and the president presented the invited guests, Dr. I. C. Riggin, State Health Commissioner, who spoke on The Medical Aspects of Civilian Defense, and Dr. Frank S. Johns of Richmond, who gave an illustrated paper on Carcinoma of the Colon with Special Reference to the One Stage Operation.

Drs. James H. Gressette, Roanoke; Glenn W. Phipps, Independence; J. M. Graybeal, Marion; and Walter S. Schiff, Marion, were elected to membership.

Dr. David B. Stuart, Roanoke, is secretary of this organization.

The South Piedmont Medical Society

Held its semi-annual meeting in Lynchburg on April 15th, with the President, Dr. E. E. Barksdale, Danville, presiding. The following program was presented: General Discussion of the Pathology of the Ureter by Dr. R. W. Upchurch, Danville; Indications for and Results from Nephropexy by Dr. W. W. Koontz, Lynchburg; Female Urethral Stones by Dr. E. L. Eastlack, South Boston; Arrehenoblastoma of the Ovary by Dr. J. W. Houck, Lynchburg; Some Remarks on War Surgery by Dr. Carrington Williams, Richmond; and Some Aspects of Cancer of the Stomach by Dr. J. Shelton Horsley, Richmond.

Officers for the ensuing year were elected as follows: President, Dr. Bernard H. Kyle, Lynchburg; vice-presidents, Drs. James R. Gorman, Lynchburg; W. C. Brann, South Boston; and R. W. Upchurch, Danville; and secretary-treasurer, Dr. F. O. Plunkett, (re-elected) Lynchburg. The next meeting will be held in Danville the third Wednesday in November.

News

The Roanoke Meeting.

Roanoke doctors are planning for a fine meeting in that city, October 5-7, and hope for a good attendance in spite of the large number of members in the armed forces of the country. Dr. M. A. Johnson, Jr., chairman of publicity, has been called into Service and Dr. G. M. Maxwell has succeeded him as chairman of this feature. All statistical information having been given, Dr. Maxwell, for that committee, extends the following invitation in verse, with the hope that all who can may attend.

To the Members of the Medical Society of Virginia

In the Valley of Virginia
Where the Roanoke River rolls
There's a warm and hearty welcome for you all,
For we'll all be glad to give you
All that Roanoke City holds,
If you'll only come to see us in the Fall.
When the autumn leaves are turning
Into silver, red and gold,
And the tang of autumn tingles in the brain
We'll remember your last visit
To us, in our Mountain Hold,
And be longing just to see your face again.

Here the silver moon keeps shining
In the heavens up above,
In the star-bespangled dome so clear and bright,
And the Roanoke friends are pining,
Their bright eyes agleam with love,
With no fear of Axis bombing every night.

So just lay aside your worries,
Put dull care away and smile,
Pack your suit-case, buy a ticket, or some gas,
And forget about your hurries,
Rest your office force awhile,
And enjoy the happy hours as they pass.
Here the mocking bird is calling
From the hill-top and the glen
And the bass are waiting for you in the stream,
And the autumn leaves are falling
As cool breezes blow again
And you only have to close your eyes and dream.

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Here the silver moon keeps shining
In the heavens up above,
In the star-bespangled dome so clear and bright,
And the Roanoke friends are pining,
Their bright eyes agleam with love,
With no fear of Axis bombing every night.

COMMITTEE ON ARRANGEMENTS.

Appointments in Medical Society of Virginia.

Due to the fact that Dr. A. D. Hart, councilor for the Eighth District, has entered the Service, Dr. R. W. Miller, president, has appointed Dr. H. B. Mulholland, also of the University, as councilor from that District until the meeting of the Society in the Fall.

Dr. J. W. Preston of Roanoke has been appointed as chairman of the Department of Clinical and Medical Education, succeeding Dr. Walter B. Martin, now in the Service, and Dr. Guy R. Fisher will act as chairman of the Medical Economics Committee in place of Dr. John Hundley, Jr., also in the Army.

Re-Appointed on State Board of Medical Examiners.

In accordance with recommendations from the House of Delegates, at its meeting last Fall, Governor Darden has recently re-appointed the following members of the State Board of Medical Examiners for a term of four years, ending March 31, 1946:

Dr. R. D. Bates, Newtown.
Dr. P. St. L. Moncure, Norfolk.
Dr. H. U. Stephenson, Richmond.
Dr. Wm. B. McIlwaine, Petersburg.
Dr. I. C. Harrison, Danville.
Dr. J. W. Preston, Roanoke.
Dr. P. W. Boyd, Winchester.
Dr. Lewis Holladay, Orange.
Dr. F. H. Smith, Abingdon.

Medical College of Virginia News

Commencement exercises closing the one hundred fourth session of the Medical College of Virginia, Richmond, will be held June 1. Dr. Harvey E. Jordan, dean of the department of medicine, University of Virginia, Charlottesville, will be the speaker. Graduates number 64 in medicine, 31 in dentistry, 22 in pharmacy, and 34 in nursing.

The honorary degree of Doctor of Science will be conferred upon Dr. Ramon Suarez, professor of tropical medicine, University of Puerto Rico, an alumnus of the school of medicine of the college.

Gifts for the current session total $136,520.88.

Dr. Jacques P. Gray, one of the unit directors of the Michigan Community Health project of the W. K. Kellogg Foundation, has been appointed professor of preventive and public health medicine, and dean of the school of medicine, effective July 1, 1942. Dr. Lee E. Sutton, Jr., who has been dean for the past ten years, will continue with the institution as professor of pediatrics. The major part of Doctor Gray's time will be given to the dean's office and associated duties. Dr. Fred J. Wampler will in the future give increasing time to industrial medicine with the title of professor of preventive and industrial medicine.

The college will begin its accelerated program for the coming session on July 6, the academic year being divided into three quarters of eleven weeks each with two weeks' vacation periods between quarters. This will permit students in the schools of medicine, dentistry, and pharmacy to graduate in three calendar years instead of four.

The hospital unit of the college, known as General Hospital 45, has been ordered to active duty. Lieutenant Colonel Powell Williams, associate professor of medicine at the college, recently succeeded Lieutenant Colonel Carrington Williams, professor of clinical surgery, as unit director. Miss Anne F. Parsons, assistant professor of nursing, will head the nursing personnel of the unit. The unit is comprised of 21 members of the medical staff, 20 of the surgical staff, 2 of the laboratory, 2 of the roentgenological, 8 of the dental, one, detachment, one, headquarters, two, medical supply, and two registrars. The nursing staff now numbers seventy-five but will be built up to one hundred twenty. Lieutenant Colonel A. Stephens Graham, associate professor of surgery, will head the surgical staff, and Major Alton D. Brashear, associate professor of anatomy, will head the dental staff. The commander of the unit, Lieutenant Colonel Powell Williams, heads the medical staff.

Dr. Porter P. Vinson, professor of bronchoscopy, esophagoscopy, and gastroscopy, gave a paper on intra-bronchial tumors at the meeting of the American Association for the Study of Neoplastic Diseases, held at Bowman-Gray Medical School, Winston Salem, North Carolina, on April 23. Dr. W. E. Pembleton, a member of his staff, accompanied him.

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News From University of Virginia, Department of Medicine.

Dr. Eugene M. Landis was elected President of the American Society of Clinical Investigation at the recent meeting in Atlantic City.

Dr. H. E. Jordan and Dr. C. C. Speidel attended the meeting of the American Association of Anatomists at the Cornell University Medical College in New York City on April 1st to 3rd. Dr. Speidel presented a motion picture demonstration on "Myelin Sheath Adjustments" and a paper (with Dr. H. E. Jordan) on "The Constancy in Number of Sarcomeres Within Individual Striated Muscle Fibres". Dr. Jordan presented a demonstration (with Dr. J. M. Robeson of Syracuse University) on "The Production of Lymphoid Nodules in the Bone Marrow of the Domestic Pigeon, Following Splenectomy".

Dr. E. P. Lehman was elected a member of the Board of Directors of the American Society for the Control of Cancer, to fill out Dr. Parran's unexpired term ending 1944. Dr. J. Shelton Horsley, Richmond, is the only other Virginian on this Board.

At the annual meeting of the Virginia Academy of Science in Roanoke, May 7th to 9th, the following members of the staff of the Medical School of the University of Virginia presented papers before the group on Preventive Medicine and Bacteriology: Dr. George McL. Lawson, on the subject "Streptococci Resistant to Sulfonamide Therapy"; Dr. William E. Bray and Mrs. Jeanette S. Carter, on the subject "A Simplified Method for Anaerobic Plate Cultures"; Drs. Ralph B. Houlihan and George McL. Lawson, on the subject "Quantitative Determinations of Myxoma Virus in Nasal Washings, Blood, Feces and Urine and Their Relations to Transmissibility"; Dr. Kenneth B. Grim, on the subject "Kodachrome Photomicrography"; Dr. William E. Bray, on the subject "Human Infection Caused by Dalmonella sandiego".

Dr. Hunter H. McGuire

Of Winchester was in May re-elected president of the Winchester Memorial Hospital, a position which he has held for a number of years.

Dr. Guy W. Horsley,

Richmond, was the principal speaker before the Sphinx Club of Acca Temple of this city on April the 30th, his subject being "Choose to Live".

Virginia Tuberculosis Association.

At the annual meeting of this Association held in Roanoke in April, Dr. Frank S. Johns, Richmond, was re-elected president, and Dr. Roy K. Flannagan, also of Richmond, was named secretary.

The John Horsley Memorial Prize

Has this year been awarded to Dr. James W. Watts, neurologist at George Washington University. This award was established at the University of Virginia by Dr. J. Shelton Horsley, Richmond, as a memorial to his father and is bestowed upon a medical graduate for the best thesis on a surgical subject. It is made every two years. Dr. Watts is a member of the class of '28, University of Virginia, Department of Medicine.

The American Congress of Physical Therapy

Will hold its 21st annual scientific and clinical session September 9-12, at the Hotel William Penn, Pittsburgh, Pa. All sessions will be open to members of the regular medical profession and their qualified aids. Information concerning the seminar and program of the convention proper may be obtained from the American Congress of Physical Therapy, 30 N. Michigan Avenue, Chicago.

"Parergon".

The second edition of this handsome book, published by Mead Johnson & Company of Evansville, Ind., has made its appearance. The name is from the Greek word meaning "work by the side of work", and demonstrates that doctors not only have hobbies but many of them talents which may be brought to the fore. The present edition carries illustrations of many lovely paintings, photographs, sculpture, drawings, and carvings.

A Get-Together for the S. M. A.

The Southern Medical Association entertained the members of the Richmond Academy of Medicine, officers of the Medical Society of Virginia, members of the faculties of Virginia's two medical schools, and others at a dinner at the John Marshall Hotel in Richmond, on May the 15th, this being the inauguration of activities in preparation for its meeting in Richmond, next Fall. The executive committee of the Council of the S. M. A. had met in Richmond that day and these doctors, other officers and

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a number of ex-presidents were at the guest table. These were introduced by the secretary-manager, Mr. C. P. Loranz, and the President, Dr. M. Pinson Neal of Columbia, Mo., a graduate of the former University College of Medicine in Richmond, gave a reminiscent talk, speaking especially of his interest in the city and his pleasure at being here again. Following this, Dr. Wyndham B. Blanton, general chairman for the meeting, introduced the members of his various committees, all of whom are interested in working for the success of this meeting.

Dates are November 9-12. Make your plans to come!

The American Association for the Study of Goiter Cancels Meeting.

On account of the present unsettled World conditions, the Council of this Association deemed it wise to cancel their annual meeting which was scheduled for June 1, 2, and 3, in Atlanta, Georgia. They hope to be able in the near future to assemble again and celebrate with a "Victory" meeting.

Dr. Winn Associated with Dr. Ware.

Dr. H. Hudnall Ware, Jr., Richmond, on May 1st announced the association of Dr. W. C. Winn in the practice of obstetrics and gynecology. Their offices are at 816 West Franklin Street, this city. Dr. Winn was for the past two years connected with the Bureau of Maternal and Child Health of the Virginia State Department of Health.

Virginia Obstetrical and Gynecological Society.

Twelve members of the Society attended the Second American Congress on Obstetrics and Gynecology in St. Louis April 6 to 10, this replacing their Travel Club for this year. An informal banquet at the Club Continental, Hotel Jefferson, on the evening of April 8th was enjoyed by all who attended. Those from Virginia were: Drs. C. J. Andrews and M. B. Savage of Norfolk, Dr. H. G. Bland of Newport News, Drs. F. O. Plunkett and S. E. Oglesby of Lynchburg, Dr. J. M. Nokes of Charlottesville, and Drs. A. L. Carson, Jr., L. L. Shamburger, H. H. Ware, Jr., and W. C. Winn of Richmond, and two honorary members, Dr. Bayard Carter of Durham, N. C., and Dr. Jas. R. Miller of Hartford, Conn.

Guests of the various members included Dr. and Mrs. S. A. Cosgrove and Dr. and Mrs. Edw. G. Waters of Jersey City, Dr. Walter B. Mount of Montclair, N. J., Mrs. M. B. Savage of Norfolk, Dr. Adam Thorp of Rocky Mount, N. C., Dr. Jno. M. Fleming of Spartanburg, S. C., Dr. Kenneth Hancock of Charlottesville, Dr. T. M. Vorbrinck of Norfolk, Dr. Robert Woodhull of Minot, N. D., and Dr. Frank R. Lock of Winston-Salem, N. C.

Dr. John O. Hurt,

For the past three years clinical director at the Lynchburg State Colony, has located in Roanoke, where he will be engaged in general practice. His office is 506 Medical Arts Building.

Dr. W. O. Bailey, Jr.,

Son of Dr. and Mrs. W. O. Bailey of Leesburg, has recently been promoted to captain in the Army medical corps. At last report, he was stationed at Trinidad, B. W. I.

National Health Council.

Dr. George S. Stevenson, medical director of the National Committee for Mental Hygiene, was recently elected president of the National Health Council, succeeding Dr. Kendall Emerson, managing director of the National Tuberculosis Association.

The National Health Council is a clearing house for eighteen national voluntary organizations promoting better health. Among the services which it renders is the maintenance of extensive library containing more than 6,000 volumes and 30,000 pamphlets dealing with public health, sanitation, hygiene and related subjects, which are available to research workers from all parts of the United States.

Married.

Captain James Otey Burke, M. C., U. S. A., and Miss Alice DeLancey Davis, Atlanta, Ga., May 2nd. Captain Burke is a graduate of the Medical College of Virginia in 1937 and is now stationed at Atlanta.

Dr. Henry St. George Tucker, Jr., Richmond, and Miss Mary Grasty Bell, Staunton, April 25th. Dr. Tucker graduated in medicine from the University of Virginia in 1937.

66 Years of Service.

Eli Lilly and Company of Indianapolis has just issued a pamphlet telling of its 66 years' existence

in a most interesting way and shows how "great oaks from little acorns grow". This company first began its work on May 16, 1876, in a small, poorly lighted building, eighteen feet wide and fifty feet long. This is in striking contrast to the present thirty-two modern buildings. Inside a small corner of this first laboratory, "fenced" off, were a little old-fashioned upright desk, a calendar, a machine for duplicating handwritten memorandums, and a potbellied stove. There was no telephone for Bell had just applied for a patent "on a machine to be known as a telephone". The business started on the sum of $1,300. Two years after the business started, it was forced into larger quarters and in 1881 it was moved to the present site. The first branch house was established in Kansas City and other branch offices have been established in New York, Chicago, and New Orleans, and a sales office in San Francisco. Ten years after the founding date, the company had fifty employees, among them being a chemist who is still at work in the Lilly Laboratories. Today there are thirty chemists and pharmacists employed in the assay and control of pharmaceutical preparations.

In spite of this vast expansion, the Eli Lilly and Company feels they are "still pioneers in the world of research. Behind the doors of the Lilly Research Laboratories are limitless plains, unexplored valleys, untouched depths in the world of chemistry. This work is yet to be done. The lights will always burn in the laboratory for our task will never be completed. At the end of sixty-six years we are at the beginning of a new era of accomplishment."

The Virginia Pediatric Society

Held it Spring Clinical meeting on May the 16th, at the Academy of Medicine Building in Richmond, with the president, Dr. W. L. Harris of Norfolk presiding. At the morning session, papers were presented by Dr. Basil B. Jones of Richmond on "An Obscure Lung Condition" and by Dr. B. M. Kagan, also of Richmond, on "Dehydration and Water Balance", illustrated with charts and case reports. Following this, luncheon was served in the dining room, after which the members held a clinical forum at the Medical College of Virginia at which several interesting cases were presented for discussion by members of the Department of Pediatrics of the College.

Dr. Leta J. White of Petersburg is vice-president, and Dr. E. A. Harper of Lynchburg secretary-treasurer.

Dr. Angus McBryde,

Associate professor of Pediatrics at Duke University, Durham, N. C., was the guest speaker before the Norfolk County Medical Society at its meeting on April the 27th, his subject being "The Premature Infant".

Members of Virginia USO Sponsoring Group.

The following doctors have been appointed as members of the State Sponsoring Committee of the Virginia USO War Fund Campaign: Dr. Staige Blackford, University; Drs. Wyndham B. Blanton, Chas. M. Caravati, Fred M. Hodges, J. Shelton Horsley, Stuart McGuire, Stuart N. Michaux, Clifton M. Miller, Roshier W. Miller, W. Lowndes Peple, and Charles R. Robins, Sr., all of Richmond.

The USO is seeking $407,000 in Virginia to provide recreational and comfort facilities for all the men in the armed forces, and the drive is to start June 1st.

International College of Surgeons.

The National Assembly of this association will be held July 15-18 at the Shirley-Savoy Hotel in Denver, Colorado, with speakers of international prominence on the program. This meeting is open to all physicians and surgeons in good standing in their state medical society and has been purposely opened to this large group that this organization might play its part in the National Defense Program.

Dr. B. B. Bagby,

Formerly with the State Health Department and more recently chief health officer and epidemiologist of the city of Richmond (pending the appointment of a permanent officer) has been named defense director of Northumberland County, and will have complete charge of civilian defense activities in that county.

For Sale.

Slightly used High Pressure Water Sterilizer Unit, on white stand. Has two 6-gallon tanks—hot water and cold, two filters, one gallon capacity distilled water attachment. Electric heat. Address "Sterlizer," care this journal, 1200 East Clay Street, Richmond. (*Adv.*)

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For Sale.

TRUVISION STERESCOPE made by General Electric, mounted on adjustable floor stand, complete with 125 volt rheostat. In use about three years; excellent condition. Price $195.00 F.O.B. Radford, Virginia. James P. King, M. D., Radford, Va. (*Adv.*)

Obituaries

Dr. William Roane Aylett,

Well known physician of Tappahannock, died April 25th after a brief illness. He was seventy-one years of age and graduated in medicine from the University of Virginia in 1895. Dr. Aylett practiced in Newport News for about twenty-five years, following which he located in Tappahannock. He had been a member of the Medical Society of Virginia since 1895. His wife survives him.

Resolutions on Dr. Doughtie.

At a recent meeting of the Norfolk County Medical Society, the following appreciation of Dr. Doughtie was presented:

Charles Wilson Doughtie was born February 20, 1877, in Nansemond County, Virginia. He received his early education in the public schools, attended the Suffolk Military Academy and was graduated from the Medical College of Virginia in 1898.

After obtaining his degree in medicine Dr. Doughtie came to Norfolk where he practised his profession until a few weeks before his death.

Soon after starting practise he became interested in surgery and in order to qualify himself he served one year as interne at the old Norfolk Protestant Hospital. This was followed by service as assistant on the Surgical and Gynecological Staffs at St. Vincents Hospital. He then attended the New York Polyclinic for further preparation.

Returning to Norfolk he resumed his practise and later became Chief of the Gynecological Service of the Norfolk General Hospital. Some years later he retired to the Consulting Staff, a place he held until his death.

The esteem in which Charles Wilson Doughtie was regarded by his associates is indicated by the positions of public service he held.

He was President of the Norfolk County Medical Society 1922-1923, the first president of the Medical Staff of the Norfolk General Hospital which he again held some years later, the first president of the Ex-Internes Organization of the Norfolk General Hospital, and also served on many civic boards.

Dr. Doughtie was a member of the Norfolk County Medical Society, Medical Society of Virginia, Seaboard Medical Association, American Medical Association, a Fellow of the American College of Surgeons, and the Norfolk and Western Surgical Association.

His sincerity, his strong sense of fairness, his unfailing kindness, courtesy and ability endeared him to all who knew him.

He is survived by his wife Alice Smith Doughtie, whom he married in 1910, and three children, Katherine Doughtie, Mrs. Robert Crile and Charles Wilson Doughtie, Jr.

In the death of Charles Wilson Doughtie the Norfolk County Medical Society has lost one of its most loyal and outstanding members.

THEREFORE, BE IT RESOLVED: That a copy of this resolution be sent to the family and a copy spread upon the records of the Norfolk County Medical Society.

C. C. SMITH
W. P. MOORE
H. M. DOLES, *Chairman.*

Resolutions on Dr. King.

The officers and members of the Arlington County Medical Society, at their regular meeting on April 23rd, recorded their deep sorrow and loss in the passing of their esteemed colleague, Dr. William Binford King.

Dr. King was born in Richmond, Virginia, and received his pre-medical education in that city. He received his medical degree from George Washington University in 1925, and was instructor in Anatomy there from 1917 to 1925, and associate professor of Anatomy from 1925 to 1932. He was President of the George Washington Medical Society in 1940 and a Member of the Executive Committee of the General Alumni Association of George Washington University in 1940. Dr. King was a member of the District of Columbia Medical Society, the Arlington County Medical Society, the Medical Society of Virginia, and a Fellow of the American Medical Association. In addition to teaching at George Washington University Dr. King also taught at Georgetown University for several years. He was a successful practitioner for many years in both Washington, D. C., and Arlington, Virginia.

Ever zealous in civic and patriotic duties, he recently devoted much time to the Metropolitan Defense program and served as Assistant Chief Medical and Liason Officer for this area.

It was always a pleasure to meet Dr. King socially and as a consultant. He will be greatly missed by his many friends in the profession.

Signed J. R. B. HUTCHINSON,
Secretary.

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Are the Neuritic Symptoms of Pregnancy *due to a deficiency of vitamin B_1 (thiamine)?*

SUCH common neuritic symptoms of pregnancy as pains in arms and legs, muscle weakness, and (less frequent but more serious) paralysis of the extremities may result from a shortage of antineuritic vitamins, recent investigations appear to show. Although neuronitis of pregnancy has long been considered a toxemia, no toxins have ever been identified.

Clinical observations of Strauss and McDonald lead to the conclusion that the condition is a dietary deficiency disorder similar to beriberi, caused by lack of vitamin B_1. They report recovery in their cases receiving this therapy, including dried brewers' yeast.

Hyperemesis as Cause of Avitaminosis

Wechsler observes that all cases of polyneuritis of pregnancy recorded in the literature were preceded by long periods of severe vomiting. "It would seem," he adds, "that because of actual starvation these patients suffered from avitaminosis and consequent neuritis," a view likewise held by Hirst, Luikart, and Gustafson. Plass and Mengert observe that the practice of giving high carbohydrate feedings for hyperemesis gravidarum is still more likely to cause avitaminosis.

Dried brewers' yeast, as it is far richer than any other food in vitamin B_1 (thiamine), is being used with benefit both in the prevention and treatment of polyneuritic symptoms of pregnancy. Lewy found that additions of yeast to the diet reduced electric irritability of the peripheral nerves and brought clinical improvement. Vorhaus states that he and his associates, after administering large amounts of vitamin B_1 (thiamine) to 250 patients having various types of neuritis, including that of pregnancy, observed in about 90% of cases "varying degrees of improvement, i.e., from partial relief of pain to complete disappearance of all symptoms."

Need for Vitamin B_1 (thiamine) in Lactation

Evans and Burr, Hartwell, Sure and co-workers, and Macy *et al* are among numerous authorities who find that the nursing mother also needs a supplement of vitamin B_1 (thiamine) from 3 to 5 times the normal requirement. It is accepted that during pregnancy and lactation the requirement for vitamin G (riboflavin) is increased.

Consisting of nonviable yeast, Mead's Brewers Yeast Tablets offer not less than 50 International vitamin B_1 (thiamine) units and 50 Sherman vitamin G (riboflavin) units per gram (20 International units of vitamin B_1 and 20 Sherman units of vitamin G per tablet).

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